PHASE III PRE-DESIGN INVESTIGATION FOR A REMEDY DECISION UPDATE

ALCAS CUTLERY CORPORATION PROPERTY

OLEAN WELLFIELD SUPERFUND SITE

OLEAN, NEW YORK

January 30, 2001

Project No. 137-09

Prepared For:

U.S. Environmental Protection Agency, Region II
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1.0 INTRODUCTION

1.1 Background

The Alcas Cutlery Corporation facility (hereinafter referred to as the Site) is located within the Olean Well Field Superfund Site. The Site is located in the eastern portion of the City of Olean and east and south of the City in the Towns of Olean and Portville in Cattaraugus County, New York as shown in Figure 1-1. The Site incorporates three municipal wells, and spans approximately 800 acres of property principally occupied by industrial facilities. The Allegheny River flows through the southwest and south portion of the Site, and State Routes 16 and 417 provide access to the area.

Groundwater in the Site's Upper Water-Bearing Zone and Lower (City) Aquifer has been impacted with trichloroethene (TCE) and other chlorinated compounds. Groundwater drawn from municipal wells 18M (north of the Allegheny River) and 37M and 38M (south of the Allegheny River) is being treated by air stripping to meet drinking water standards prior to distribution to the City of Olean. Potentially responsible parties (PRPs) residing within the Site boundary and found to be contributing to the groundwater problem include the Alcas Property, AVX Corporation (AVX), McGraw-Edison and Loohn's Dry Cleaners and Launderers.

In 1996, a remedy decision was issued by the U.S. Environmental Protection Agency (EPA) Region II, and was given in the Record of Decision for the Second Operating Unit (OU2 ROD). The selected remedial action for the Site was vapor enhanced recovery (VER) for the Upper Water-Bearing Zone with no additional ground water treatment necessary due to the groundwater capture of 18M in the lower aquifer.

In 1999, Alcoa conducted an evaluation of the past remedy decision, the basis used for that decision, and the technical practicability of that decision. The purpose of the evaluation was to review whether and to what extent the Site remedy may require updating using EPA's Reform Program for Updating Remedy Decisions.

The evaluation revealed that the original Site Conceptual Model ("*SCM*") used for the selection of remedial actions in the OU2 ROD at the Olean Well Field was based on regional data with only limited Alcas site-specific data. The remedial objectives and remedy decision were based on this model for the Site, and did not factor site-specific conditions or the current state of science and practice for chlorinated solvent sites. Therefore, the remedy decision and expectations were not practicable and/or realistic for the Site.

On this basis, an updated Site Evaluation and Conceptual Model Report was submitted to EPA on January 17, 2000 for purposes of updating the SCM for Alcas. A letter followed this submittal on January 25, 2000 to present significant new information, initial review findings, and provide for update of the Alcas remedy decision in order to enable remedial progress in accordance with statutory requirements.

Alcoa conducted this Phase III Pre-Design Investigation to establish a pre-design basis for remedy updating in accordance with Section 9.0 of Alternatives Analysis Report and Formal Request for a Remedy Decision Update, dated July 14, 2000 (Update Request Report) and to confirm the updated Site Conceptual Model submitted in January 2000.

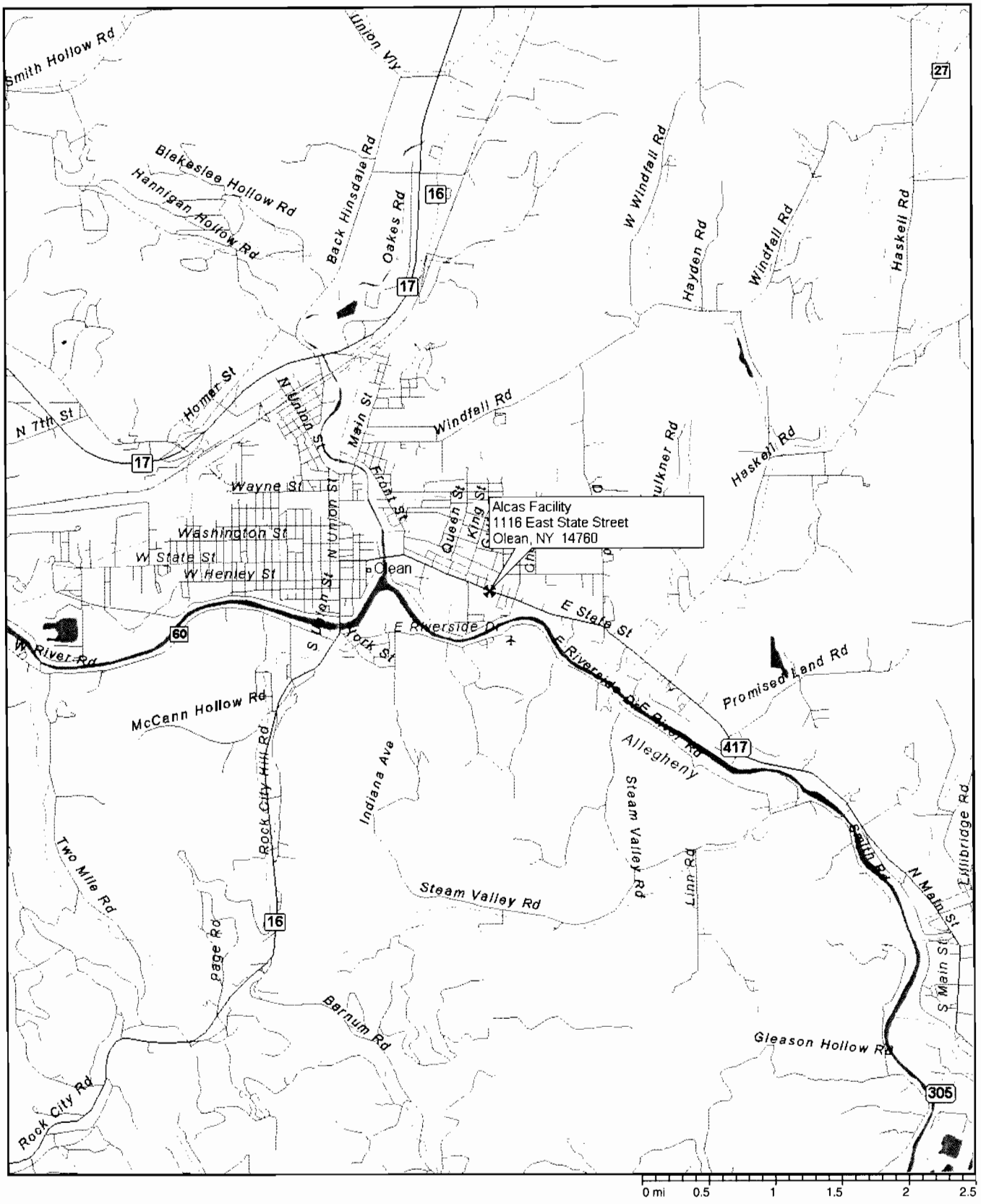

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Figure 1-1
Alcas Site Facility Map

1.2 Objectives

The objectives of the Phase III Pre-Design Investigation were as follows:

1. Collect additional data to further verify that a DNAPL source(s) is beneath the main Alcas building;
2. Determine ground water flow direction in the Upper Zone; and
3. Determine off-site extent of affected ground water in the Upper Zone.

These objectives were designed to assist in updating the SCM as well as address issues brought up in discussions with the EPA at the June 15, 2000 meeting.

2.0 FIELD INVESTIGATION

A total of 12 micro-wells were installed on and off-site to define the direction of ground water flow in the Upper Water-Bearing Zone, to verify that affected ground water is migrating from under the manufacturing building, and to delineate the down gradient extent of Upper Water-Bearing Zone affected ground water.

RU-1 was installed at the northern edge of the site, and was used to establish groundwater conditions as it flows onto the Site. RU-2 and RU-6 were placed at the east and west sides of the building to show the lateral extent of migration from under the building. RU-5 was placed inside the former boiler room within the main building. This location is due south of the former TCE storage area and adjacent to one of the former vapor degreaser locations. The location of this well was to verify that the TCE plume concentration indicates a DNAPL source(s) from under the building. The wells along the southern edge of the building (RU-3 and RU-4) were used to further verify that the source of the chlorinated compounds in the ground water is from under the building. RU-7 was installed between the eastern edge of the building and the 18-M to be used primarily to establish ground water flow direction in the Upper Zone. The remaining wells (RU-8, RU-9, RU-10, RU-11, and RU-12) were used to delineate the extent of affected ground water in the expected direction of ground water flow in the Upper Zone. The location of these monitor wells is shown in Figure 2-1. The well completion information is provided in Table 2-1.

The borings for the monitor wells were advanced using a Geoprobe® unit. The borings were continuously sampled using the Macro Core open sampler. The procedure for sampling followed the plan submitted on March 26, 1999 in the "*Remedial Design and Remedial Action Work Plan, Appendix C Sampling, Analysis and Monitoring Plan*", prepared by ICF Kaiser Engineers. Inc. Boring logs for the twelve monitor wells are in Appendix A.

Wells RU-2, RU-3, RU-4, RU-11, and RU-12 were all pushed to greater depths than the well was completed. RU-2 and RU-11 were pushed in new locations approximately one to two feet from the original boring. RU-3 was not grouted in the bottom two feet because the borehole collapsed. In RU-4, the lower portion of the boring collapsed to within 3 feet of the well depth. This 3-foot interval was grouted before the well was set. In RU-12, the lower portion of the boring collapsed to within 5 feet of the well depth. This 5-foot interval was grouted before the well was set. All of the remaining wells were completed as described in the work plan. A typical micro-well completion diagram is shown in Figure 2-2.

Soil samples were collected from each boring and sent to a laboratory for geotechnical testing. Three to seven samples were collected from each boring. The samples were collected from different stratigraphic zones to ensure that each zone was classified properly. The geotechnical laboratory results are given in Appendix B. No soil samples were sent to the laboratory for chemical analysis. A photo-ionization detector (PID) was used to scan the soil cores. Headspace readings were collected from core sections, which demonstrated a detectable concentration on the PID during the scan. The highest headspace PID reading was 234 from the 18 to 19 foot interval in the RU-4 boring. Several other headspace readings exceeded background in the RU-4 boring. No other borings had PID readings above background.

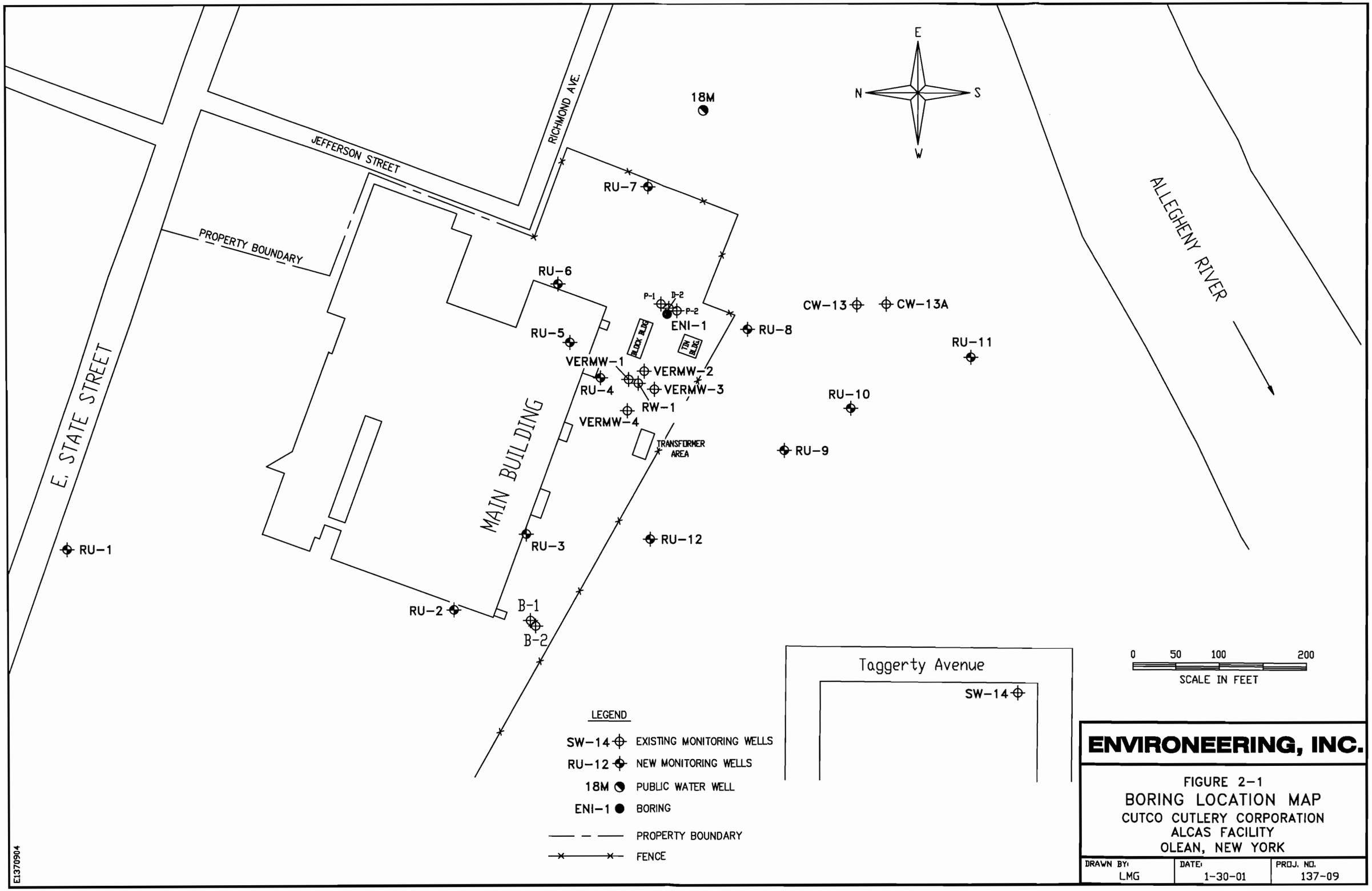

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FIGURE 2-1
BORING LOCATION MAP
CUTCO CUTLERY CORPORATION
ALCAS FACILITY
OLEAN, NEW YORK

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TABLE 2-1

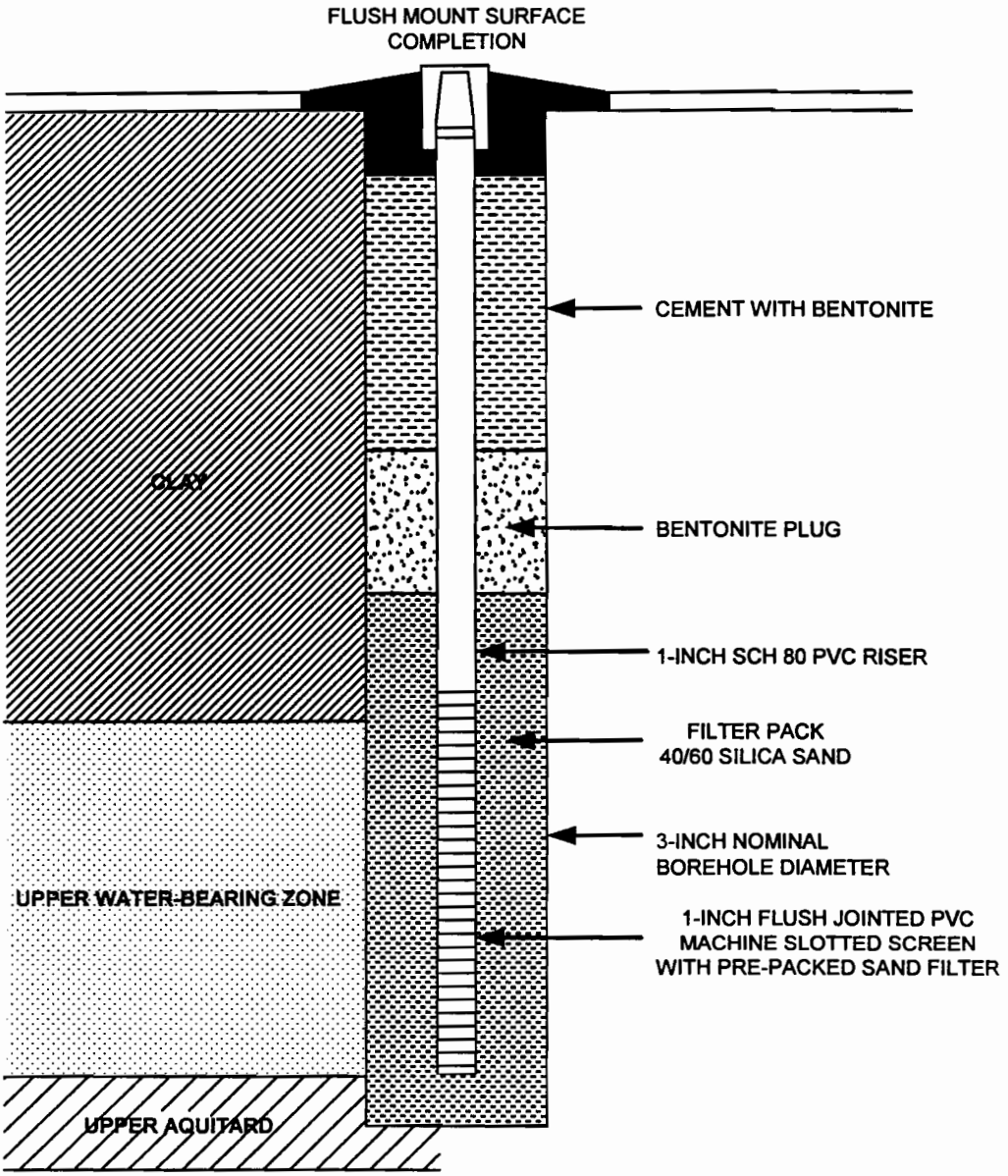
Well Completion Table

Olean Wellfield Superfund Site
Alcas Facility, Olean New York

Well No.	Well Diameter (in.)	Top of Casing Elevation (ft.)	Water Bearing Unit Screened	Groundwater Elevation (ft.)	Total Boring Depth (ft. bgs)	Total Well Depth (ft. bgs)	Screened Interval Elevation		Filter Pack Interval	
							Bottom (ft.)	Top (ft.)	Bottom (ft. bgs)	Top (ft. bgs)
RU-1	1	1429.35	Upper	1413.55	32	32	1397.35	1406.35	32	21
RU-2[a]	1	1427.45	Lower	1400.15	33	29	1398.45	1407.45	29	18
RU-3[b]	1	1428.72	Upper/Lower	1401.35	30	30	1400.72	1409.72	30	27
RU-4[c]	1	1424.88	Upper	1412.17	32	20	1404.88	1413.88	20	9
RU-5	1	1424.48	Upper	1412.01	24	24	1400.48	1409.48	24	13
RU-6	1	1424.95	Upper	1410.59	24	24	1400.95	1409.95	24	13
RU-7	1	1429.10	Upper	1403.82	28	28	1401.10	1410.10	28	17
RU-8	1	1423.92	Upper	1409.25	24	24	1399.92	1408.92	24	13
RU-9	1	1420.72	Upper	1411.47	17	17	1403.72	1412.72	17	16
RU-10	1	1421.07	Upper	1411.28	17	17	1404.07	1413.07	17	16
RU-11[a]	1	1420.07	Upper	1412.06	40	19	1401.07	1410.07	19	18
RU-12[c]	1	1419.28	Upper	1414.00	28	13	1406.28	1415.28	13	2

Notes:

[a] Well completed immediately adjacent to the original boring. Original boring was grouted from surface to total depth.
[b] Approximately 3 feet below bottom of screen collapsed and was not grouted.
[c] Approximately 3 to 5 feet below the bottom of the screen was grouted. Remainder of the boring below the grouted interval collapsed.
1. Wells completed with Scheduled 80 PVC casing and screen. Screen opening was 0.01-inch machine slot.
2. RU-2 was screened in the lower portion of the Upper Aquitard and the upper few feet of the City Aquifer.



NOT TO SCALE

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FIGURE 2-2
TYPICAL MICRO-WELL COMPLETION DIAGRAM
ALCAS FACILITY OLEAN, NEW YORK
ALUMINUM COMPANY OF AMERICA

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To verify ground water flow direction and the migration path of the plume, a synoptic round of water level measurements were taken. Only wells that are screened in the Upper Water-Bearing Zone were used to establish flow direction. Ground water elevations were measured from the following new and existing wells:

- RU-1 through RU-12;
- B-1;
- CW-5A, 10B, 12B, 13, 15A;
- SW-14;
- RW-1; and
- VERMW-1 through 4.

In addition, water level measurements were taken in the following Upper Water-Bearing Zone and City Aquifer well clusters:

- B-1 and B-2;
- CW 13 and CW 13A;
- CW 15 and CW 15A; and
- D2 and P2.

The data collected from these locations was evaluated to assess the vertical flow component occurring at the site.

The wells were developed using a peristaltic pump as described in the Work Plan. The wells were allowed to recover at least 24 hours before groundwater measurements were collected. The wells were purged and sampled using a dedicated bailer. The samples were immediately placed on ice and shipped via courier to the laboratory.

Monitor well sampling was conducted in accordance with the plan submitted on March 26, 1999 in the "*Remedial Design and Remedial Action Work Plan, Appendix C Sampling, Analysis and Monitoring Plan*", prepared by ICF Kaiser Engineers. Inc. The sampling of the monitor wells began by purging at minimum of three well volumes from each well using a dedicated bailer. After the wells were purged, they were allowed to recover at least 24 hours before groundwater measurements were taken. The wells were sampled using the dedicated bailers. The ground water samples were analyzed for the following site-specific chlorinated organic constituents:

- Tetrachloroethene;
- Trichloroethene;
- cis and trans 1,2-Dichloroethene; and
- Vinyl Chloride.

The field notes for all the drilling, lithologic logging, well construction and development, and groundwater sampling are contained in Appendix C.

3.0 RESULTS

3.1 Regional Geology

The following discussion of regional geology is based on "*Olean Well Field Remedial Investigation and Feasibility Study, Town and City of Olean, New York*", prepared by Engineering-Science, May 1985.

The City of Olean is located in the Appalachian Highland Physiographic province, an upland of moderate relief underlain by sedimentary rocks dipping south at approximately 2 degrees. Several continental ice sheets covered most of this region during the Pleistocene Epoch (1,600,000 to 10,000 years before the present). The glaciers, however, never progressed south of the Allegheny River Valley in western New York. The nonglaciated area, called the Salamanca Re-entrant, is the northernmost area in the eastern United States to escape Pleistocene glaciation.

Geologic and geophysical analysis of borehole data reveal that the upper 100 feet of sediment can be divided into 5 lithologic units, distinguished primarily on the basis of color, texture, grain size, and mode of deposition. These units are identified as Units A through E, from oldest to youngest (deepest to shallowest) and discussed below.

With the exception of Unit E, the sediments described are probably associated with a late Wisconsinian glaciation. Unit A is primarily glacio-lacustrine clays directly above the bedrock. Unit B is likely a glacial outwash associated with the melting of large blocks of disintegrating (stagnant) ice. The unsorted sand, gravel, and silt portions of the unit may actually be a melt-out till. The sandier lenses, some of which are stratified, either reflect channelized deposition from braided streams.

The till unit (Unit C) is identified by its olive to olive-gray appearance and poorly sorted texture. Grain size curves, from wet sieve and hydrometer analysis, clearly distinguish Unit B as much coarser than Unit C with Unit C containing a large percentage (>50 percent) of silt and clay in addition to gravel and sands.

The sequence of sediments deposited above Unit C appears to be fluvial in origin, although the sequence can be subdivided into 2 units. Unit D is a coarse sandy gravel directly overlying Unit C that has been classified as glacio-fluvial materials. Fine sands and silts and occasional clay or gravel deposits make up Unit E, and have been grouped as recent alluvium, implying deposition by modern river processes of the Allegheny River.

3.2 Regional Hydrology

Hydrogeologic units are units of consistent hydraulic properties. They may be composed of one lithologic unit, a group of lithologic units, or parts of a unit. Consequently, lithologic and hydrologic units may not coincide.

The five lithologic units identified in the area have been grouped into four hydrologic units: Upper Water-Bearing Zone, Lower Aquifer, Upper Aquitard, and Lower Aquitard. Unit D (glacial fluvial sands and gravel) and Unit E (recent fluvial deposits including fine sands and silts and some fill) comprise the Upper Water-Bearing Zone, although local clay lenses may act as discontinuous semi-confining layers. Unit B (glacial outwash), combined with sandy lenses in the upper part of Unit A, forms the City Aquifer.

Unit C (till, perhaps more specifically a lodgment till) comprises the Upper Aquitard, which separates the two water-bearing units. The layered glacio-lacustrine silts and clays of Unit A form a Lower Aquitard beneath the City Aquifer separating this aquifer from the underlying bedrock.

3.3 Site Geology

The Site geology generally follows the regional geology described in Section 3.1. At the Site, four of the five lithologic units have been identified. To illustrate the Site geology, three geological cross sections were constructed. The location of these cross sections is shown in Figure 3-1. The lithologic units logged during this investigation are shown in Cross-Sections A-A', B-B', and C-C' in Figures 3-2, 3-3, and 3-4, respectively.

The field logging compared very favorably to the lithologic descriptions derived from the geotechnical laboratory data. Of the 67 geotechnical samples collected, only 10 had a different lithological classification than was logged in the field. Generally, the field descriptions for these samples were in agreement with the percentages of sands and clays. Where a difference between the field and the laboratory description occurred, the laboratory description was used in this report. Most of the discrepancies were when the sample contained 45 to 50 percent sand, but was logged in the field as a clay, or vice versa.

The lowest unit encountered during this investigation is the City Aquifer (Unit B), which is predominately gravel with sand and clay. Based on the sieve analyses, the percentage of sand in this unit ranged from 92 to 95 percent sand. The City Aquifer also was identified as glacial outwash in *"Site Evaluation and Conceptual Model Report"*, prepared by ENVIRONEERING. This unit is very permeable, and yields significant quantities of water. The top of the City Aquifer is 25 to 30 feet deep (approximate elevation of 1400 feet) in the western portion of the Site dipping to the east and south. The top of the City Aquifer was not encountered at a depth of 40 feet (elevation of 1380 feet) in RU-11.

The Upper Aquitard (Unit C) is silty clay with gravel, and was identified by it olive gray color and/or the gravel content. This unit contained 50 to 97 percent clay based on the sieve analyses. The thickness of this unit is highly variable across the Site. The Upper Aquitard was identified as glacial till in *"Site Evaluation and Conceptual Model Report"*.

In the western portion of the Site, the Upper Water-Bearing Zone (Unit D) is absent as shown in Figure 3-4 at RU-2. The Upper Water-Bearing Zone was identified in the *"Site Evaluation and Conceptual Model Report"* as fluvial deposits. In the central part, the Upper Water-Bearing Zone is thickest, and has two distinct areas of higher permeability sediments. The first is in RU-3, which is a silty gravel with sand zone comprising the Upper Water-Bearing Zone as shown in Figure 3-4. This zone is limited areally grading to clayey sand in RU-12, which is only 130 feet south of RU-3. The more extensive high permeable zone extends from RU-5 south to RU-9, RU-10, and RU-11. The sand content in this zone ranged from 78 to 86 percent. This zone is characterized by either coarse sand or gravel or a thicker sequence of clayey sand. The balance of the Upper Water-Bearing Zone had a clay content that ranged from 13 to 49 percent as derived from the sieve analyses. The vast majority of this zone had a clay content that ranged from 30 to 45 percent not including the higher permeability zones. The average clay content of the 20 samples in the Upper Water-Bearing Zone is 37 percent also not including the higher permeability zones.

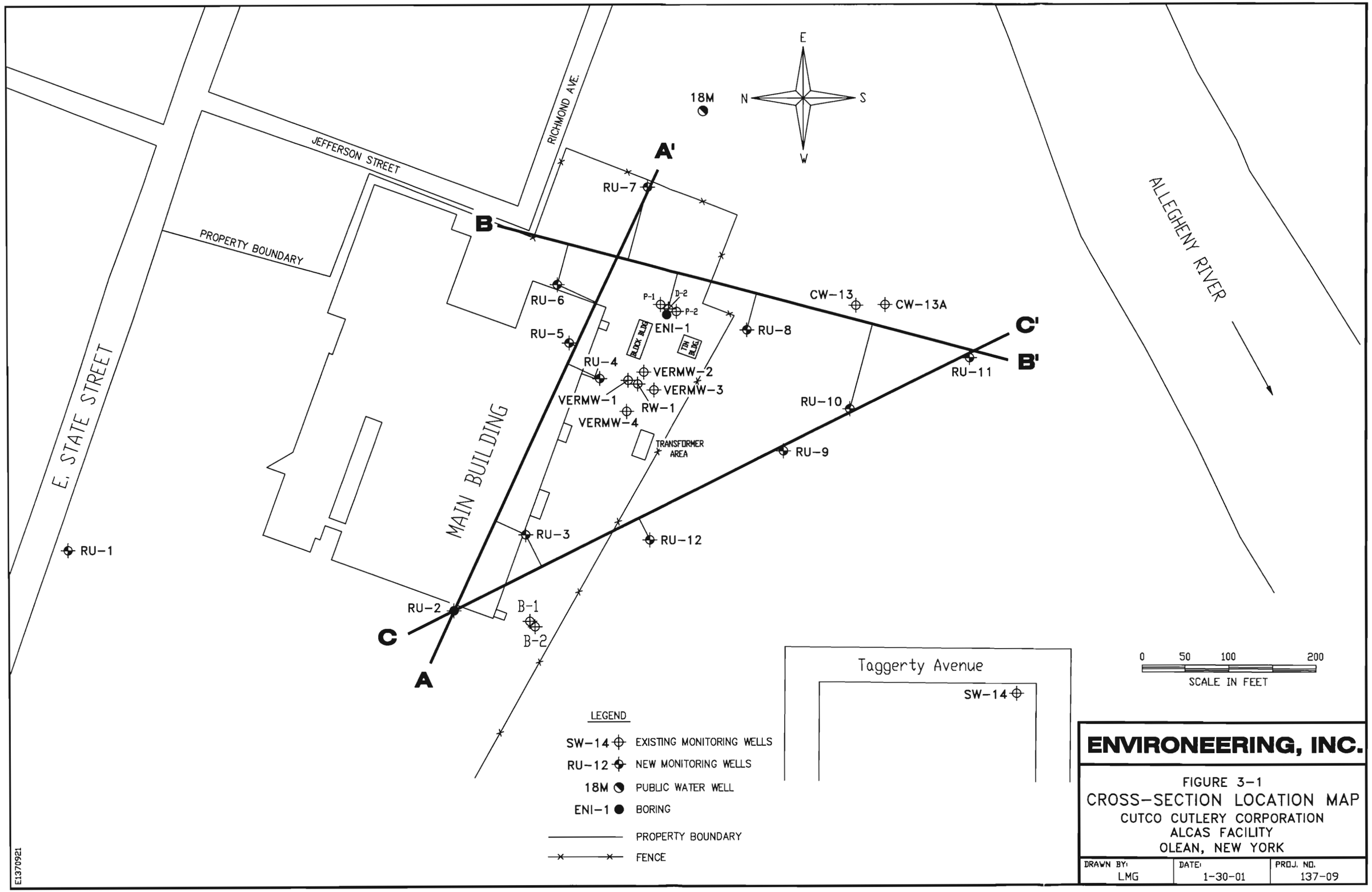

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FIGURE 3-1
CROSS-SECTION LOCATION MAP
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ALCAS FACILITY
OLEAN, NEW YORK

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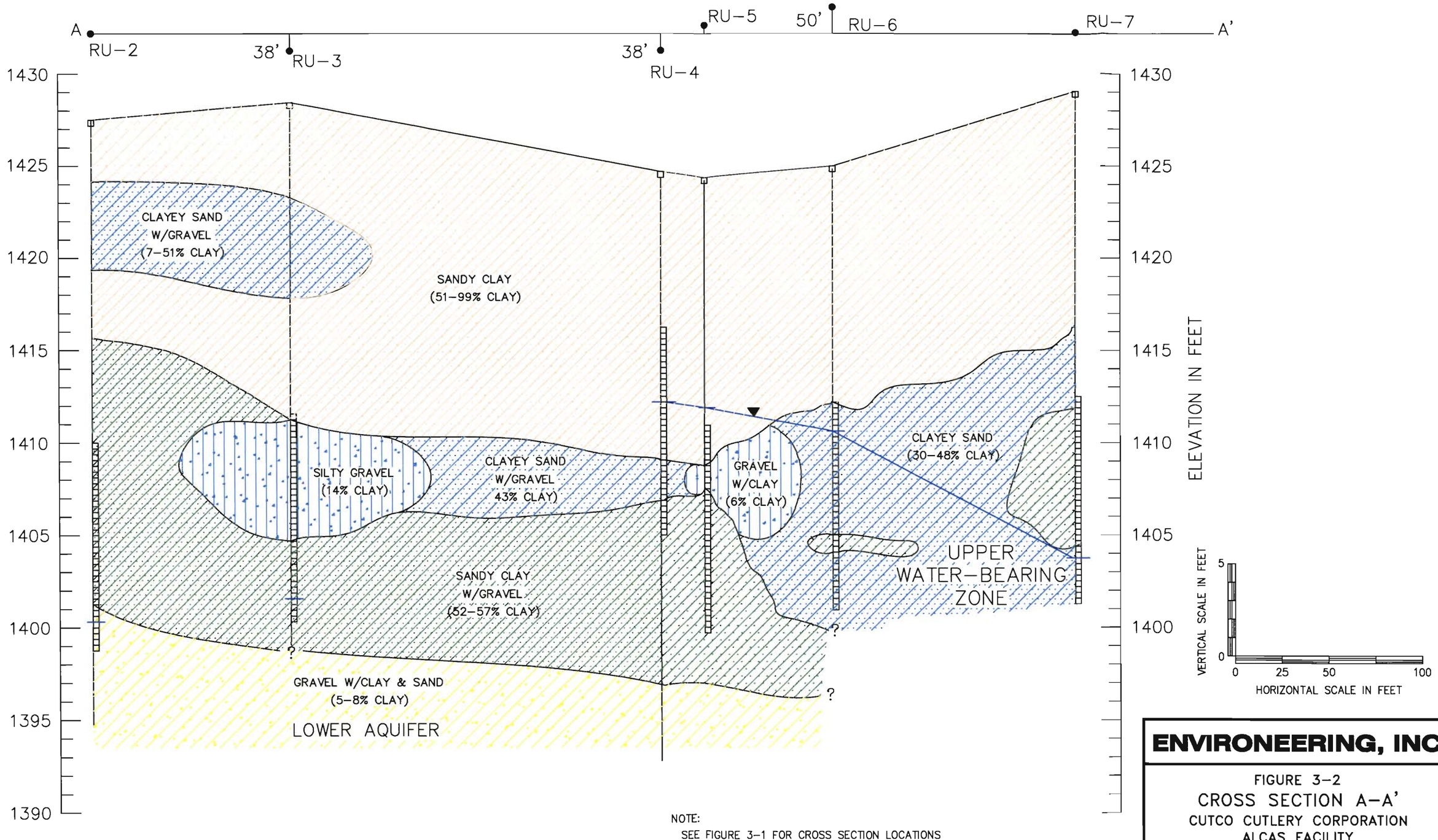

NOTE:
SEE FIGURE 3-1 FOR CROSS SECTION LOCATIONS

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FIGURE 3-2
CROSS SECTION A-A'
CUTCO CUTLERY CORPORATION
ALCAS FACILITY
OLEAN, NEW YORK

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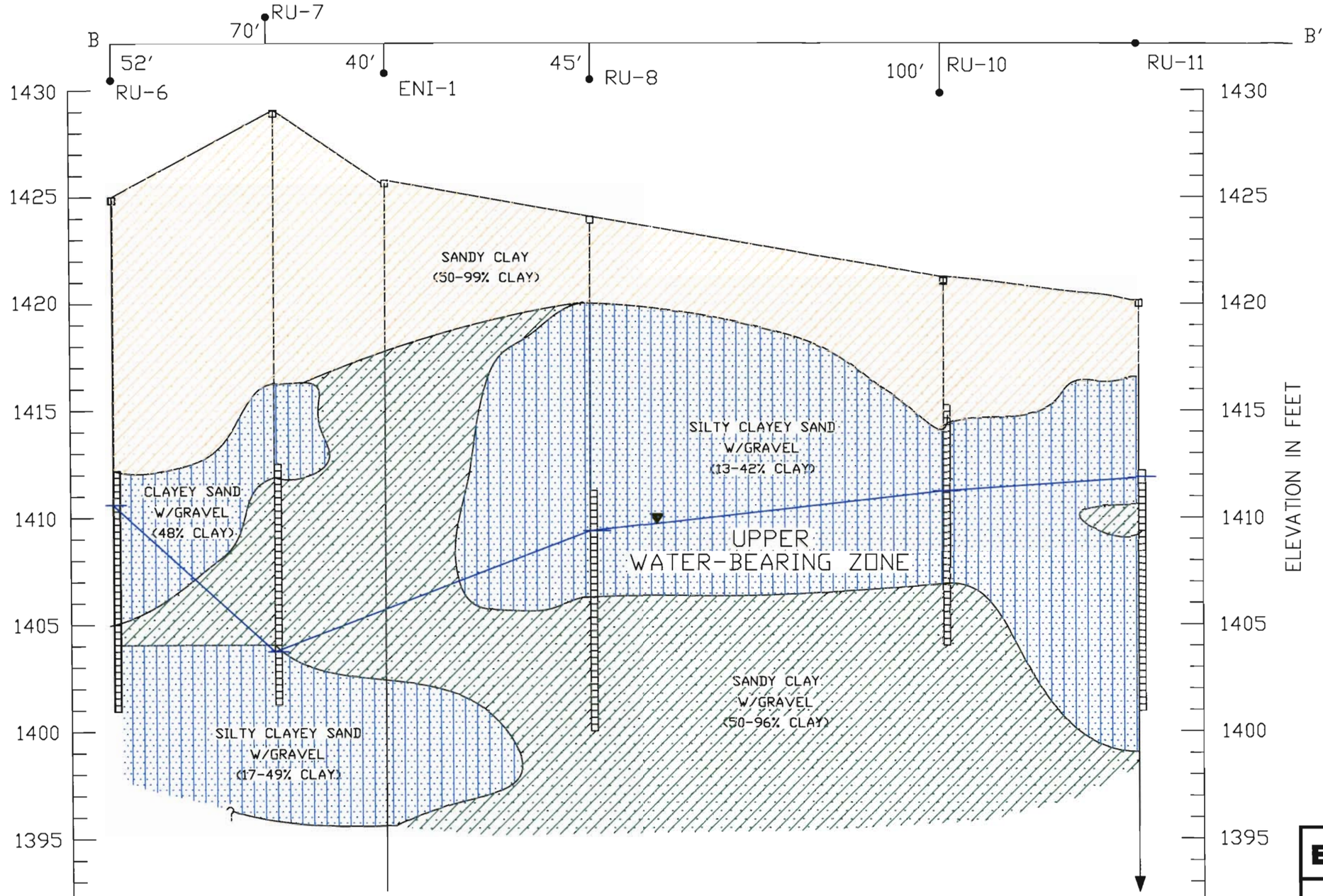

NOTE:
SEE FIGURE 3-1 FOR CROSS SECTION LOCATIONS

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FIGURE 3-3
CROSS SECTION B-B'
CUTCO CUTLERY CORPORATION
ALCAS FACILITY
OLEAN, NEW YORK

DRAWN BY:	DATE:	PROJ. NO.
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C
39'
RU-3
C'
RU-2
RU-12
RU-9
RU-10
RU-11
1430
1425
1420
1415
1410
1405
1400
1395
1390
ELEVATION IN FEET
CLAYEY SAND
W/GRAVEL
(7-26% CLAY)
SANDY CLAY
(50-77% CLAY)
SILTY GRAVEL
W/SAND
(14% CLAY)
COARSE
SILTY CLAYEY SAND
(22% CLAY)
SILTY CLAYEY SAND
(13-41% CLAY)
UPPER
WATER-BEARING
ZONE
CLAYEY SAND
AND GRAVEL
(40% CLAY)
SANDY CLAY
W/GRAVEL
(52-97% CLAY)
Total
Depth
1380
GRAVEL W/
CLAY & SAND
(5-8% CLAY)
LOWER AQUIFER
?
?
VERTICAL SCALE IN FEET
5
0
0
25
50
100
HORIZONTAL SCALE IN FEET
E1370903

NOTE:
SEE FIGURE 3-1 FOR CROSS SECTION LOCATIONS

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FIGURE 3-4
CROSS SECTION C-C'
CUTCO CUTLERY CORPORATION
ALCAS FACILITY
OLEAN, NEW YORK

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Above the water-bearing sands is surficial clay layer (Unit E) that is part of the Upper Water-Bearing Zone. This unit is 3 to 17 feet thick with the thickest part in the northern portion of the Site, and the thinnest to the south towards the river. The clay content of this unit ranges from 50 to 99 percent. This clay is most likely alluvial in nature, and is identified by its tan color and minimal to no gravel. The surficial clay layer contains both fluvial deposits and fill as identified in *Site Evaluation and Conceptual Model Report."*

3.4 Site Hydrology

Groundwater flow in the Upper Water-Bearing Zone is depicted in the water table contour map in Figure 3-5. This contour map is all the shallow wells that were installed as part of this investigation along with the shallow wells near the Site, namely CW-13A, SW-14, and CW-15A. One shallow well, RU-3, did not have a water-level elevation that is consistent with the other Upper Water-Bearing Zone wells, and was not included in this contour map. The Upper Water-Bearing Zone is present as shown in Figures 3-2 and 3-4. Based on this water table contour map, groundwater is flowing to the east near the Alcas Building and toward the south in the southern part of the study area. It is believed that the shape of the water table contour map is in response to the pumping from the City Aquifer from 18M, 37M, and/or 38M. The elongated area south of the Alcas plant in the vicinity of RU-9, RU-10, and RU-11 represents an area of higher permeability because the contours in this narrow zone are more widely spaced. This is consistent with the geological characterization given in Section 3.3.

A significant vertical component of flow from the Upper Water-Bearing Zone into the City Aquifer exists at the Site. This is verified by the vertical gradient that is created by the leakage through the Upper Aquitard that has been increased with the pumping from the City wells in the near vicinity. The average difference in hydraulic heads in four nested well pairs at and near the Site was 11 feet in October 2000. The four well pairs include P-2 and D-2, CW-13 and CW-13A, CW-15 and CW-15A, and B-1 and B-2. Based on the stratigraphy of the Upper Water-Bearing Zone, it is estimated that the horizontal hydraulic conductivity (K_{UBZ}) would range from 10^{-5} to 10^{-4} cm/sec (2.8×10^{-2} to 2.8×10^{-1} ft/day). The vertical hydraulic conductivity (K_{UA}) of the Upper Aquitard is estimated at 10^{-6} cm/sec (2.8×10^{-3} ft/day). The average head difference between each nested well pair is 11 feet, and the average thickness of the Upper Aquitard is 15 feet. The resultant vertical hydraulic gradient would be 0.73 feet/foot. The horizontal hydraulic gradient in the Upper Water-Bearing Zone is 0.05 feet/foot as measured near RU-8. The vertical and horizontal flux (or Darcian velocity), q, is computed as $q = Ki$. The vertical flux is 2.1×10^{-3} ft/day, and the horizontal flux ranges from 1.4×10^{-3} to 1.4×10^{-2} ft/day. By comparison, the flow through the Upper Aquitard (vertical component) is 0.1 to 2 times the flow in the Upper Water-Bearing Zone (horizontal component). With the horizontal and vertical flow components being essentially equal, the vertical flow at the Site is significant. This further substantiates that a significant portion of the flow in the Upper Water-Bearing Zone is leaking into the City Aquifer, and is captured by the City wells.

3.5 Groundwater Sampling

The monitor wells installed during this investigation (RU-1 through RU-12) were sampled and analyzed for the COCs. The results of these analyses are given in Table 3-1. The Laboratory Summary Report and Data Validation Report are contained in Appendix D.

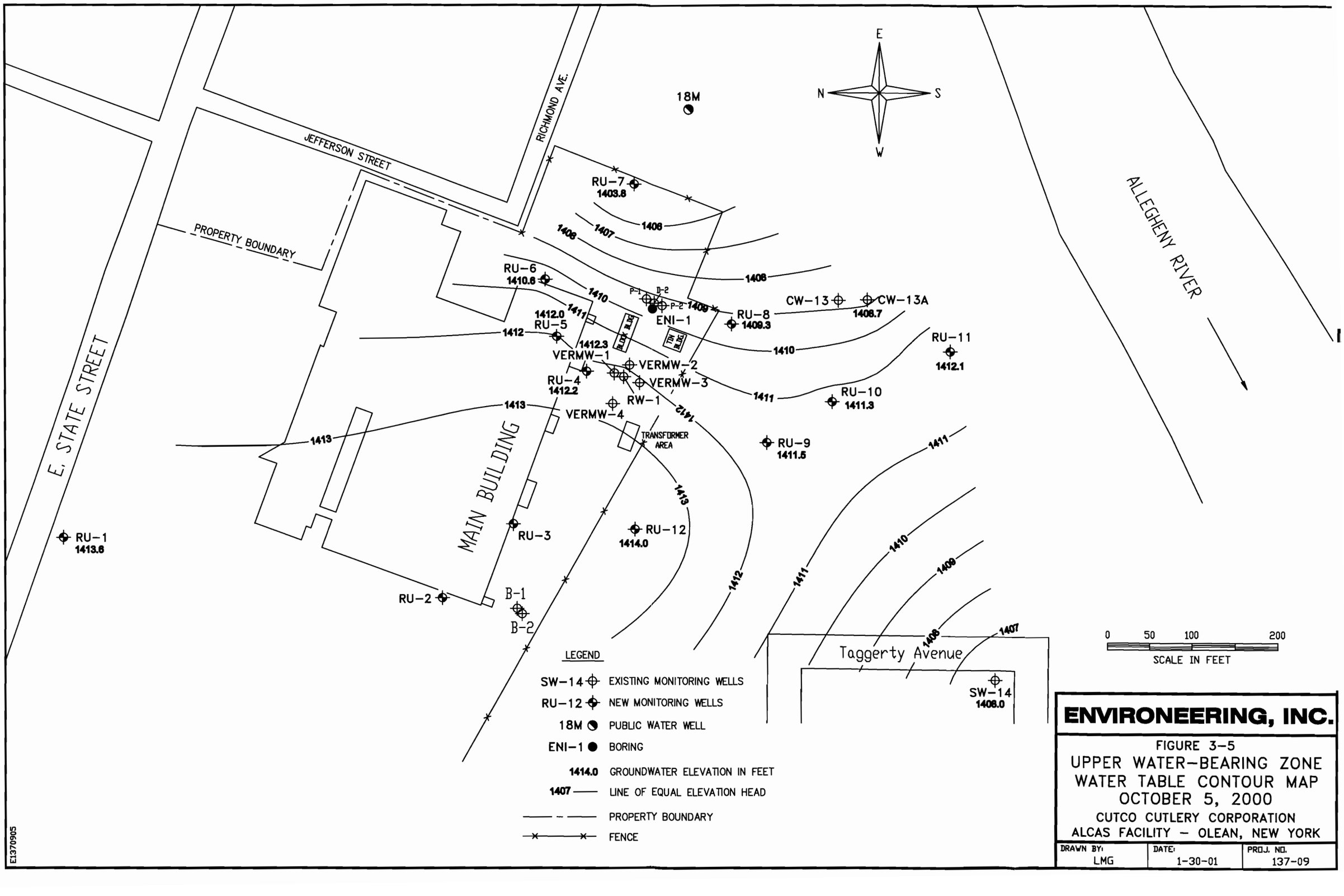

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FIGURE 3-5
UPPER WATER-BEARING ZONE
WATER TABLE CONTOUR MAP
OCTOBER 5, 2000
CUTCO CUTLERY CORPORATION
ALCAS FACILITY - OLEAN, NEW YORK

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TABLE 3-1
GROUNDWATER SAMPLING SUMMARY
OCTOBER, 2000
OLEAN WELLFIELD
ALCAS SITE
ALCOA REMEDIATION

Sample ID Number		RU-1	RU-2	RU-3	RU-4	RU-5	RU-6	RU-7	RU-8	RU-9	RU-10	RU-11	RU-12
Laboratory ID Number		06908-01	06908-02	06908-03	06908-04	06908-05	06908-06	06908-07	06908-08	06908-09	06908-10	06908-11	06908-12
Laboratory Dilution Number			06908-02-DL	06908-03-DL	06908-04-DL	06908-05-DL	06908-06-DL		06908-08-DL				
Field Duplicate ID					06908-13								
	Units												
Tetrachloroethene	ug/L	1.0U	1.0U	0.40J (1.0)	500U	19.0J	52.0	1.0U	2.0U	1.0U	20U	1.0U	1.0U
Trichloroethene	ug/L	67.0	300D	240D	130,000D	54,000D	67,000	3.00	360D	4.00	2,800	0.40J (1.0)	3.00
cis 1,2-Dichloroethene	ug/L	1.00	3.00	39.0	4,600	170	420	1.0U	39.0	1.0U	1,000	1.0U	10.0
trans 1,2-Dichloroethene	ug/L	1.0U	1.0U	0.80J (1.0)	110J (500)	50.0U	12.0J (50)	1.0U	2.0U	1.0U	17.0J (20)	1.0U	0.50J (1.0)
Vinyl Chloride	ug/L	1.0U	0.40J(1.0)	38.0	1,100	33.0J (50)	14.0J (50)	1.0U	10.0	1.0U	130	1.0U	6.00

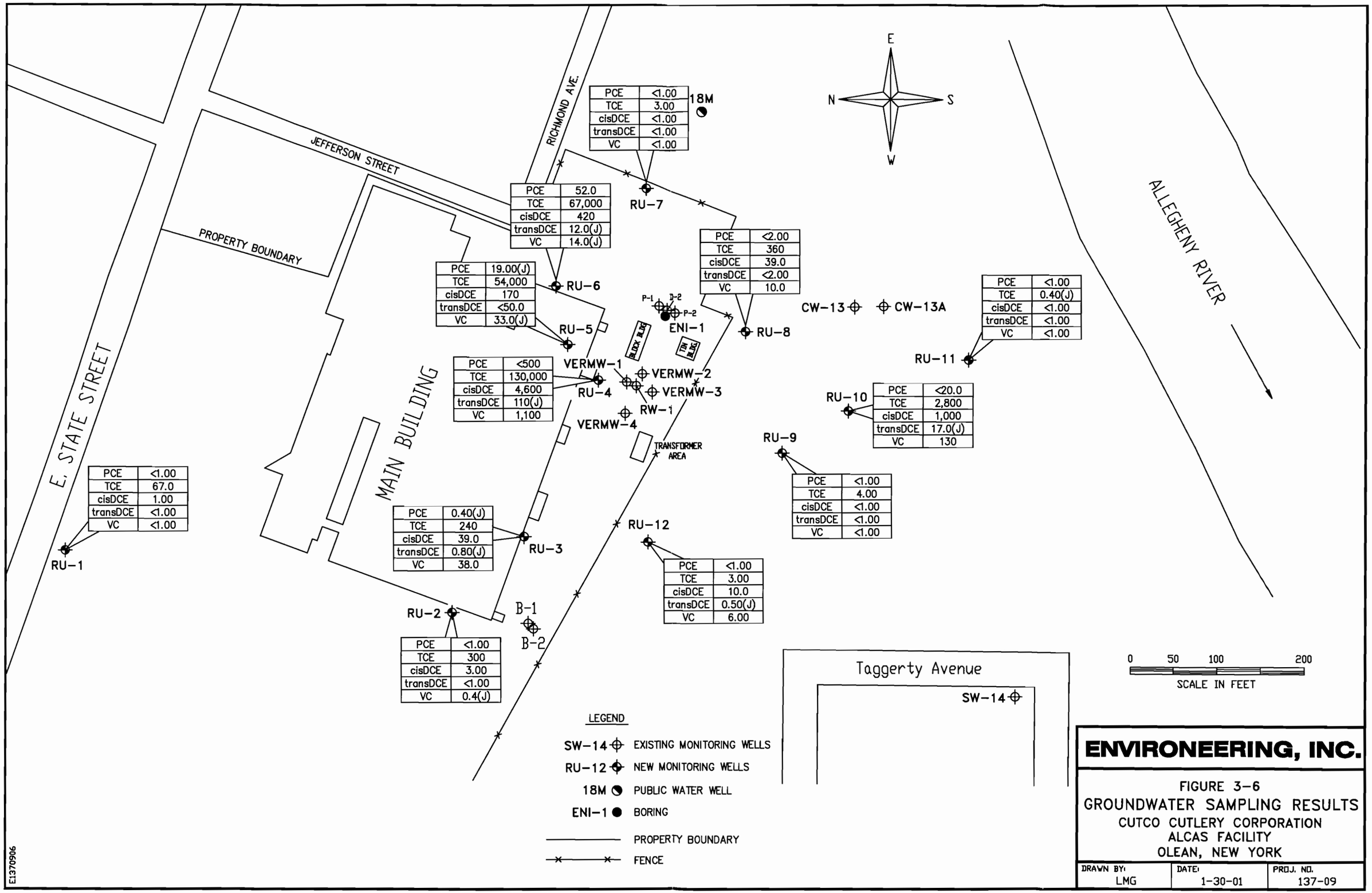
"U" denotes not detected at the designated value.
"J" denotes an estimated value below the detection limit. Value presented in parentheses is the detection limit.
"D" denotes a diluted sample at the designated value.

The results from sampling the Upper Water-Bearing Zone wells are shown graphically in Figure 3-6. As shown, the wells had detectable concentrations of TCE and various by products and degradations compounds. The primary COC based on these sample results is TCE.

The sampling results show several key components of the contaminant distribution at the Alcas facility. The wells around the southeast corner of the building (RU-4, RU-5, and RU-6) have TCE concentrations that exceed 1 percent of the solubility of TCE in water (solubility limit). This indicates that at or upgradient of this location is a DNAPL source. This places this source of DNAPL under the building. This substantiates this part of the conceptual model given in *"Site Evaluation and Conceptual Model Report, Alcas Cutlery Corporation Property, Olean Well Field Superfund Site, Olean, New York"* prepared by ENVIRONEERING, INC. The dissolved-phase plume is shown to be off site having migrated generally to the south with the direction of groundwater flow. The extent of affected groundwater is not completely delineated as the TCE concentration in RU-10 and RU-12 exceeds the MCL. Finally, the facility background well, RU-1, has a TCE concentration of 67 µg/L. This well is upgradient of the facility, and this TCE concentration is apparently from an off-site location.

The concentration of TCE in RU-2 and RU-3 was 300 µg/L and 240 µg/L, respectively. As discussed in Section 3.4, RU-3 has a lower water level equal to that in the City Aquifer. The water level and the TCE concentration in this well reflect the conditions in the lower portion of the Upper Aquitard. RU-2 is screened in the lower portion of the Upper Aquitard and the upper few feet of the City Aquifer. The TCE concentration detected in these two wells indicate the affected groundwater has migrated and is migrating through the Upper Aquitard into the City Aquifer. This further substantiates the significant flow (leakage) from the Upper Water-Bearing Zone into the City Aquifer.

The TCE concentrations from the October 2000 sampling event were contoured, and are shown in Figure 3-7. This isoconcentration map shows the migration of TCE to be to the south within a fairly narrow band. It is believed that the more permeable zone that was shown to exist south of the facility helped produced this migration pattern.

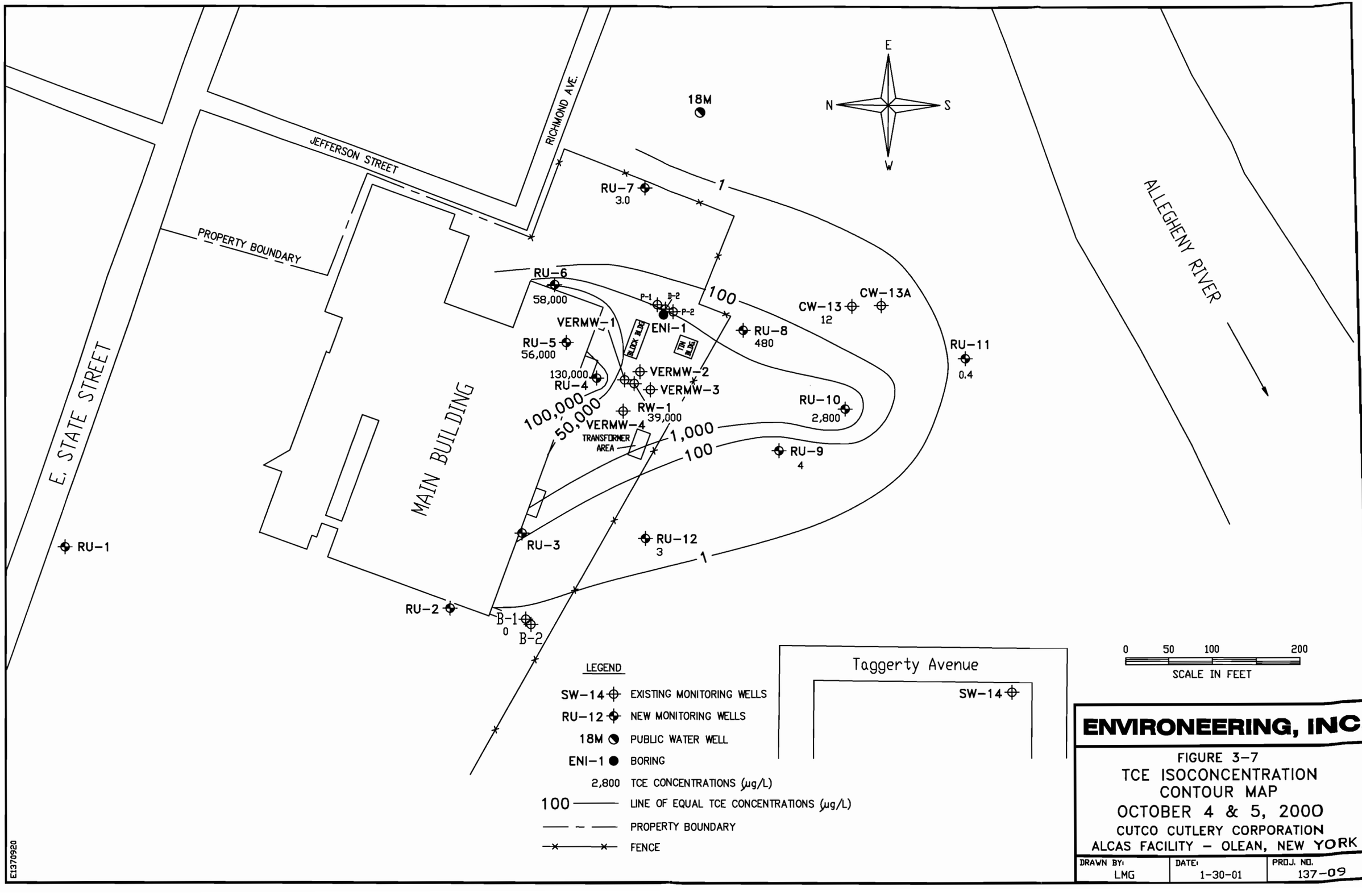


E1370906

ENVIRONEERING, INC.

FIGURE 3-6
GROUNDWATER SAMPLING RESULTS
CUTCO CUTLERY CORPORATION
ALCAS FACILITY
OLEAN, NEW YORK

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-30-01	137-09



ENVIRONEERING, INC.

FIGURE 3-7
TCE ISOCONCENTRATION CONTOUR MAP
OCTOBER 4 & 5, 2000
CUTCO CUTLERY CORPORATION
ALCAS FACILITY - OLEAN, NEW YORK

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-30-01	137-09

E1370920

4.0 CONCLUSIONS

4.1 Conclusions

The following conclusions were drawn based on the field investigation and subsequent data analyses:

- The Site geology conforms to the previously reported regional geology for the Olean Well Field Superfund Site;
- The Upper Water-Bearing Zone is absent in the western part of the Site near the Alcas Building;
- In the central part of the Site, the Upper Water-Bearing Zone is thickest, and has two distinct areas of higher permeability sediments. The first is at RU-3, and is limited in areal extent to approximately 130 feet south of RU-3. The more extensive high permeable zone extends from RU-5 south to RU-9, RU-10, and RU-11;
- Groundwater flow in the Upper Water-Bearing Zone is to the east and southeast toward the municipal wells in the eastern half of the Site, and is to the south toward the Allegheny River in the western half of the Site;
- Flow through the Upper Aquitard (vertical component) is approximately equal to the flow in the Upper Water-Bearing Zone (horizontal component) making the vertical flow at the Site significant. This further substantiates that a significant portion of the flow in the Upper Water-Bearing Zone is leaking into the City Aquifer, and is captured by the City wells;
- The dissolved-phase plume is shown to be off site having migrated generally to the south with the direction of groundwater flow. The extent of the dissolved-phase plume has not been delineated to the south.
- The wells around the southeast corner of the building (RU-4, RU-5, and RU-6) have TCE concentrations that exceed 1 percent of the solubility of TCE in water (solubility limit). This indicates that at or upgradient of this location is a DNAPL source. This places the major source of DNAPL at the Site under the building; and
- The investigation clearly demonstrates that the Site Conceptual Model inferred in the OU2 ROD was incorrect. This model was relied on for the selection of the site remedy, VER, which would not be an effective method of treatment at this site. Therefore, the selected remedy for this Site needs to be updated.

APPENDIX A

BORING LOGS

DRILLER: BUFFALO DRILLING
WORK ORDER: 137-09
DATE COMPLETED: 9-27-00
METHOD: GEOPROBE

GEOLOGIST: J. BYRD
CLIENT: ALCOA, INC.
LOCATION: 1116 E. STATE ST.
OLEAN, NY

NOTES:

LOCATION

SOIL BORING ENI-1

MONITOR WELL NA

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
						CLAY, DARK W/GRAVEL, GRASS & ROOTS
						SANDY LEAN CLAY, TAN W/ROOTS & GRAVEL
5						
	0					INCREASING CLAY
						OLIVE GRAY W/GRAVEL, ROCKS & LITTLE SILT
10	0					
15	0					INCREASING SILT
20	0					
	0					SHALE LAYER AT 23'
	0					SANDY LEAN CLAY, TAN, SILTY W/GRAVEL, MOIST
25	0					SILTY CLAYEY SAND, COARSE W/SILT & LG. GRAVEL ▼
	0					CLAY LAYER, TAN W/GRAVEL, SAND & SILT
						SANDY LEAN CLAY, COARSE W/LARGE GRAVEL & ROCK
30						
	0					SANDY LAYER
35						
	0					COARSE SAND & GRAVEL
						END OF BORING
40						

E1370907

ENVIRONEERING, INC.

BORING LOG.

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-23-01	137-09

DRILLER: BUFFALO DRILLING
WORK ORDER: 137-09
DATE COMPLETED: 9-28-00
METHOD: GEOPROBE

GEOLOGIST: J. BYRD
CLIENT: ALCOA, INC.
LOCATION: 1116 E. STATE ST.
OLEAN, NY

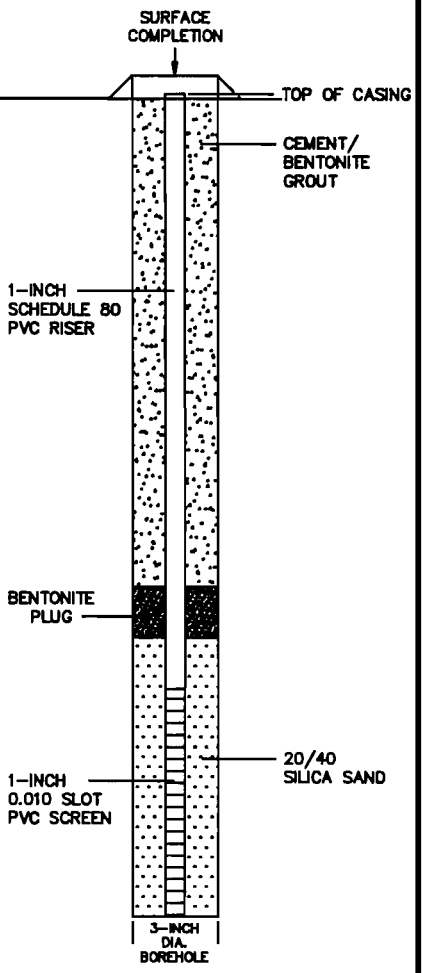
NOTES:

LOCATION

SOIL BORING RU-1

MONITOR WELL RU-1

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					ASPHALT
	0					GRAVEL, TAN
						FIRM, GRAY SANDY LEAN CLAY W/GRAVEL
5	0					IRON STAINING, SILTY, LIGHT
						ROCK, TAN
	0					CLAY, RED, FIRM W/FEW SMALL GRAVEL
	0					GRAY W/GRAVEL & INCREASING SAND
10						
						SILTY CLAYEY SAND, FIRM OLIVE GRAY W/GRAVEL & ROCK, FEW IRON NODULES
15	0					MORE TAN
	0					
20						SILTY CLAYEY GRAVEL, GRAY W/SAND
	0					VERY SILTY, SATURATED ▼
25						CLAY SAND, FIRM W/GRAVEL
	0					FIRM W/DECLINING GRAVEL SIZE
30						
						SANDY LEAN CLAY W/GRAVEL
						END OF BORING
35						
40						



E1370908

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
WORK ORDER: 137-09
DATE COMPLETED: 9-28-00
METHOD: GEOPROBE

GEOLOGIST: J. BYRD
CLIENT: ALCOA, INC.
LOCATION: 1116 E. STATE ST. OLEAN, NY

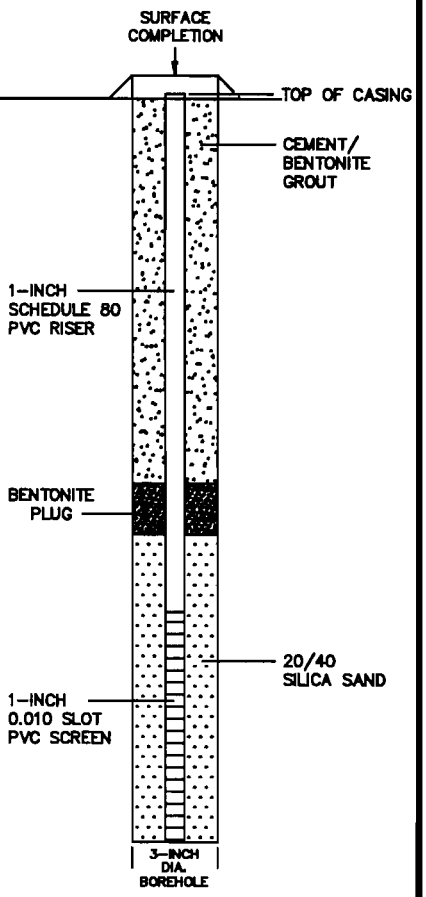
NOTES:

LOCATION

SOIL BORING RU-2

MONITOR WELL RU-2

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					CLAY, ORGANIC. DK. SILTY, GRASS AT SURFACE W/GRAVEL
	0					POORLY GRADED GRAVEL FILL, TAN, DARK STAINED W/IRON NODULES, HAIR
5	0					POORLY GRADED SAND, TAN W/GRAVEL, CLAY & ROCK
	0					
10	0					SANDY SILTY CLAY, OLIVE GRAY
						SANDY LEAN CLAY, FIRM OLIVE GRAY/TAN W/ROCK & GRAVEL, LITTLE SILT
15	0					
20	0					
						THIN SILT LAYERS
25	0					
	0					GRAVEL, COARSE, BROWN W/SILTY CLAY & SAND
30	0					
	0					END OF BORING
35						
40						



E1370909

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-27-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

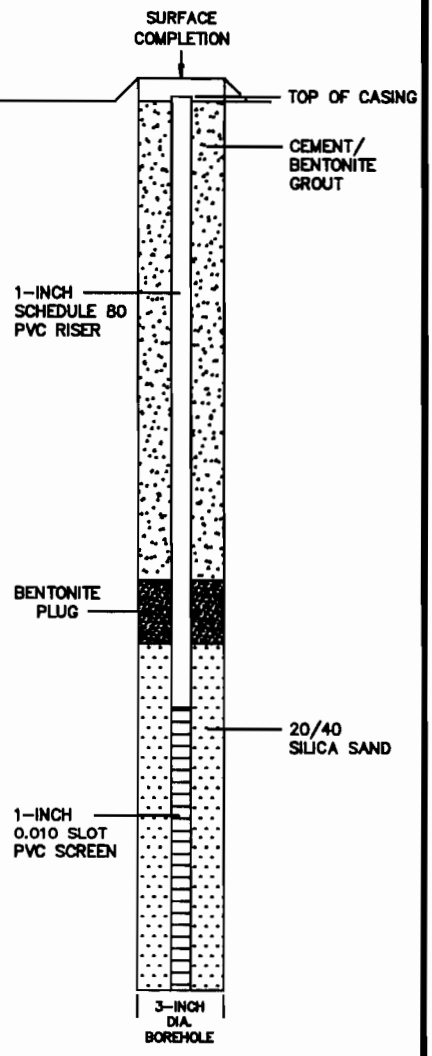
NOTES:

LOCATION

SOIL BORING RU-3

MONITOR WELL RU-3

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY SILTY CLAY, FIRM BROWN W/ROOTS & SMALL GRAVEL, BURNT MATERIAL & TAR OR ASPHALT, PIECES OF RED CONGLOMERATE
5	0					CLAYEY SAND, DARK GRAY W/FEW SOFT CALCITE NODULES, FEW ROOTS & BURNT WOOD CHIPS & GRAVEL
10	0					SILT LAYER, LIGHT TAN AT 8.5' LIGHTER COLOR W/SOME LG. GRAVEL
	0					SILTY CLAY, DARK BROWN W/LG. GRAVEL, ORGANIC
15	0					SANDY LEAN CLAY, OLIVE GRAY W/GRAVEL SHALE ROCK AT 15.5'
	0					SILTY GRAVEL, LOOSE SMALL & LARGE W/POOR MICA & SANDSTONE
20	0					
25	0					SANDY LEAN CLAY, TAN W/SILT LAYERS & GRAVEL GRAY W/FEW IRON NODULES
30						END OF BORING



E1370912

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-26-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

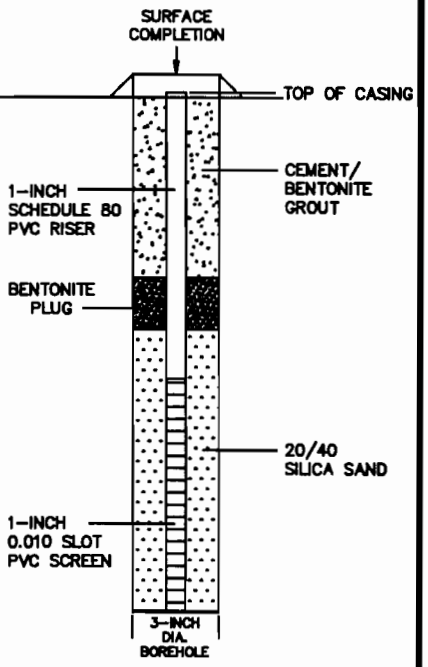
NOTES:

LOCATION

SOIL BORING RU-4

MONITOR WELL RU-4

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
						CONCRETE
	37					SANDY LEAN CLAY, FIRM GRAY W/SMALL ROCKS & LIGHT IRON STAINING
	92					COARSE ROCK
5	64					ROCK DECREASING IN SIZE, MOSTLY RED
	16					ROOT TRACES, MAGNESIUM & IRON NODULES, SMALL GRAVEL
10						LARGE & SMALL GRAVEL, FOSSILIZED MATERIAL
	7					
	16					SHALE LAYER, GRAY
15						CLAY SAND, TAN, SATURATED W/SM. GRAVEL
						SILTY CLAYEY SAND, FIRM GRAY W/LARGE ROCKS & GRAVEL
	37					GRAVELLY LEAN CLAY, SOFT SILTY OLIVE/GRAY
20	234					W/SMALL ROCKS & SAND
						THIN LAYER DARK GRAY GRAVEL
	16					
25						
	29.5					GRAVEL, LARGE & SMALL, SAND & SILT
30						
						END OF BORING
35						
40						



E1370910

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING GEOLOGIST: J. BYRD

WORK ORDER: 137-09 CLIENT: ALCOA, INC.

DATE COMPLETED: 10-02-00 LOCATION: 1116 E. STATE ST.

METHOD: GEOPROBE OLEAN, NY

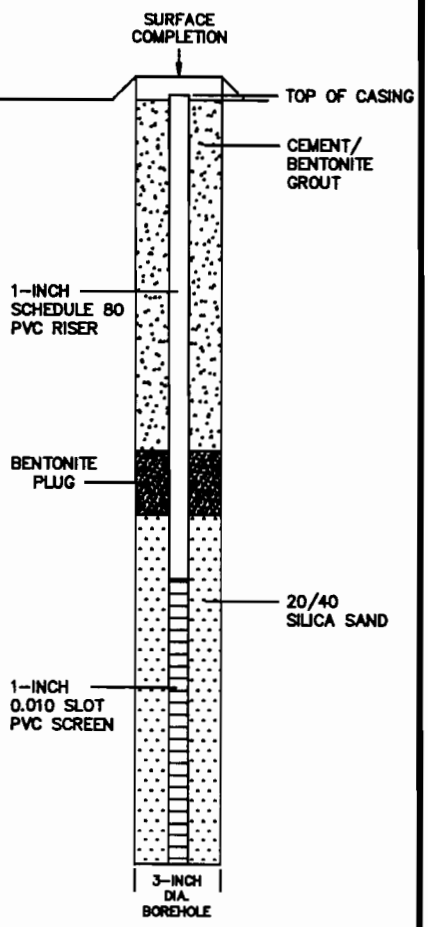
NOTES:

LOCATION

SOIL BORING RU-5

MONITOR WELL RU-5

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY SILTY CLAY, RED/BROWN W/LITTLE GRAVEL
5	0					BROWN W/SMALL & LARGE GRAVEL
	0					CLAY SILT, TAN W/GRAVEL
10	0					SANDY LEAN CLAY, GRAY W/GRAVEL ROCK AT 10'
15	2					WELL GRADED GRAVEL, COARSE W/CLAY & SAND
	6					
	0					SANDY LEAN CLAY, FIRM GRAY W/GRAVEL & SILT
20	4					VERY SILTY
25						END OF BORING
30						



E1370913

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-27-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

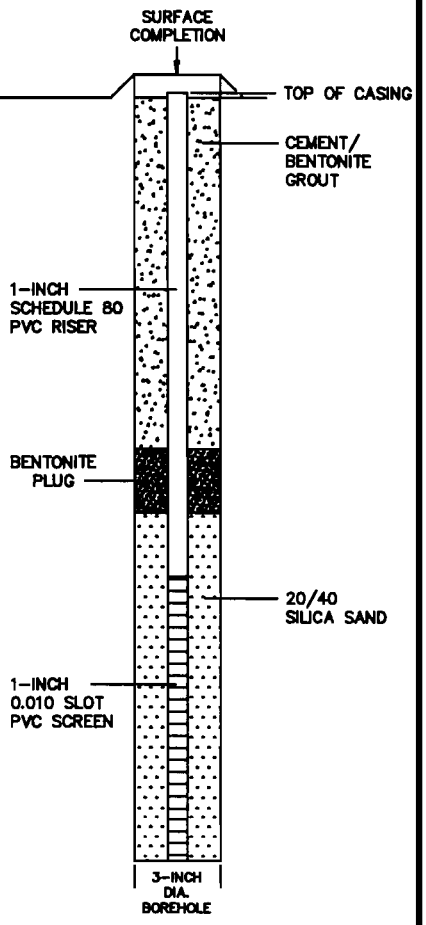
NOTES: _____

LOCATION

SOIL BORING RU-6

MONITOR WELL RU-6

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
						CONCRETE
	0					WELL GRADED GRAVEL, LARGE, SAND & LITTLE SILT
5						SANDY SILTY CLAY, SOFT TAN W/FEW LARGE ROCKS
	0					LARGE GRAVEL
	0					MORE CLAY
10						SHALE, GRAY
	0					SANDY LEAN CLAY, GRAY W/LITTLE SMALL GRAVEL & MAGNESIUM NODULES
						SILTY CLAYEY SAND, OLIVE GRAY W/ LARGE GRAVEL
15	0					INCREASING SILT
	1					SHALE
20						SANDY SILTY CLAY, SOFT W/LITTLE SAND
	0					CLAYEY SAND, FIRM W/GRAVEL
	77					
	122					END OF BORING
25						
30						



E1370914

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-26-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

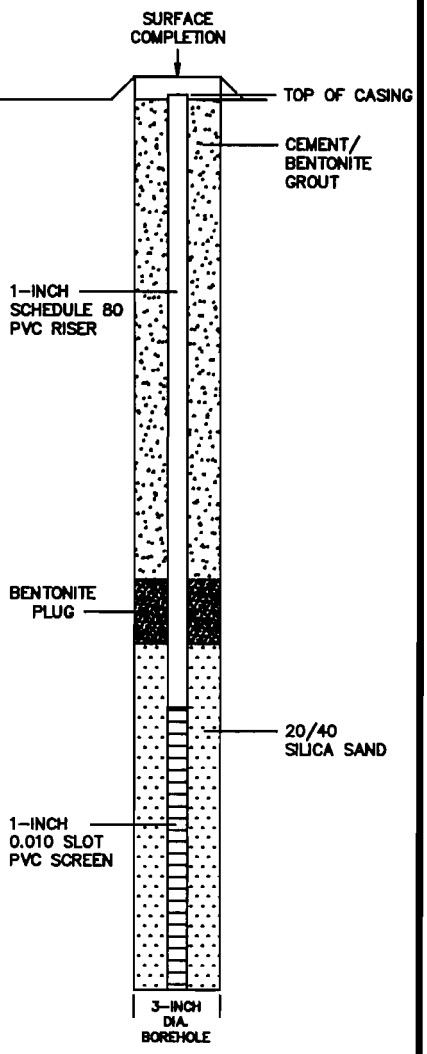
NOTES:

LOCATION

SOIL BORING RU-7

MONITOR WELL RU-7

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0						SILTY LEAN CLAY, OLIVE TAN W/GRASS & ROOTS AT SURFACE SMALL & LARGE GRAVEL
5	0					INCREASING MOISTURE & FEW ORGANIC NODULES
	0					
10	0					SANDY LEAN CLAY, MOIST W/SMALL & LARGE ROCKS, RED
	0					
15						SILTY CLAYEY SAND W/GRAVEL, OLIVE GRAY W/BROWN SHALE
	0					
	0					SHALE, BROWN W/SANDY SILT
20						SANDY LEAN CLAY, OLIVE GRAY W/GRAVEL
	0					SILT LAYER ▼
						CLAY SAND, FIRM TAN W/FEW ROCKS & GRAVEL
25	0					
	0					
	0					
30						END OF BORING



E1370916

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 10-01-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

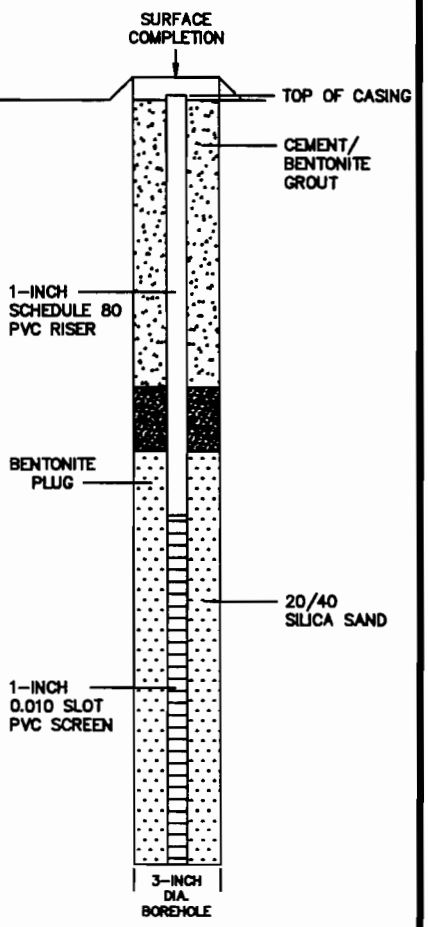
NOTES:

LOCATION

SOIL BORING RU-8

MONITOR WELL RU-8

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY LEAN CLAY, BLACK, OIL STAINED W/ROOTS & GRASS
						TAN W/LITTLE GRAVEL, LIGHTER NEAR 4'
5	0					MOIST AT 4-8'
						ORGANIC LAYER AT 8.5'
	0					SILTY SAND, TAN W/GRAVEL, MOIST
10	0					SILTY SAND, OLIVE GRAY W/GRAVEL
	0					LIGHT GRAY
15	0					
						CLAYEY SAND, GRAY W/GRAVEL
	0					SANDY LEAN CLAY, FIRM, GRAY W/GRAVEL
20	0					MOIST
	0					
25						END OF BORING
30						



E1370915

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-29-00
LOCATION: 1116 E. STATE ST.
OLEAN, NY
METHOD: GEOPROBE

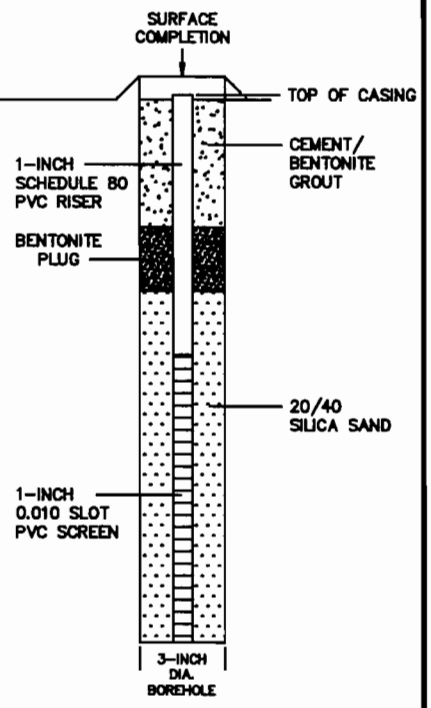
NOTES:

LOCATION

SOIL BORING RU-9

MONITOR WELL RU-9

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY LEAN CLAY, BROWN W/ROOTS & ORGANIC NODULES & GRAVEL GRASS AT SURFACE
						GRAY
5	0					SAND, TAN/RED, LITTLE SILT
	0					SILTY CLAYEY SAND, TAN, MOIST W/IRON NODULES, COARSE W/GRAVEL ▼
10	0					
						COARSE GRAVEL, CLAY
15	0					SANDY LEAN CLAY, BROWN, LAYERED
	0					END OF BORING
20						
25						
30						



E1370917

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-30-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

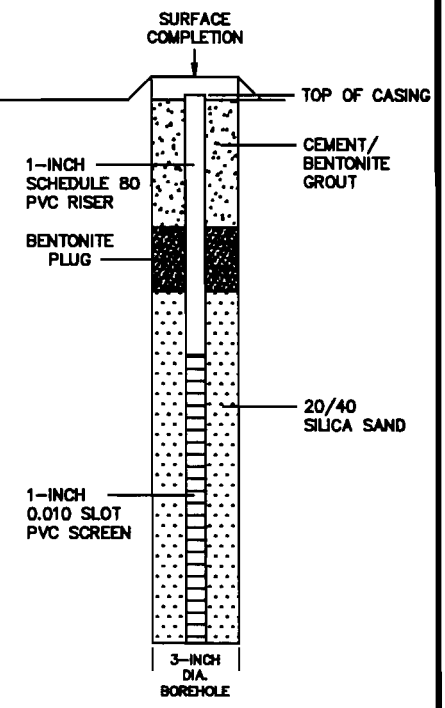
NOTES:

LOCATION

SOIL BORING RU-10

MONITOR WELL RU-10

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0						SANDY LEAN CLAY, BROWN, ROOTS & GRASS, LIGHT IRON STAINING
5	0					GRAVEL & INCREASING SAND
	0					
	0					SILTY CLAYEY SAND, BROWN/TAN ▼
10	0					
	0					SANDY LEAN CLAY, BROWN, DECREASING SAND W/DEPTH, GRAVEL
15	0					SILTY, LITTLE SAND
	0					END OF BORING
20						
25						
30						



E1370918

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-30-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

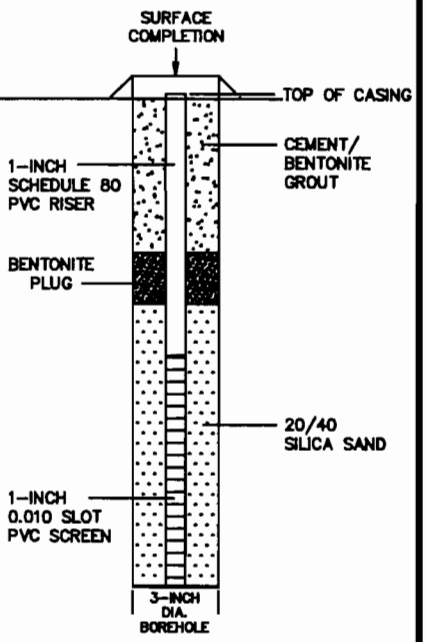
NOTES:

LOCATION

SOIL BORING RU-11

MONITOR WELL RU-11

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY LEAN CLAY, GRAY, BURNT WOOD, ROOTS & GRASS AT SURFACE
						GLASS FRAGMENTS AT 2'
						BROWNISH AT 3'
5						SILTY CLAYEY SAND, SOFT W/ROOTS AT 3-3.5', TURNING MOSTLY GRAY AT 4'
						ROCK AT 6.2 & 7.5'
						GRAVEL THROUGH OUT W/LITTLE SAND
						LARGE GRAVEL & ROCK, FIRM AT 9.5' ▼
10	0					SANDY LEAN CLAY, SOFT, TAN
	0					GRAY
15	0					
	0					CLAYEY SAND, OLIVE GRAY W/GRAVEL
20	0					
	0					SANDY LEAN CLAY, GRAY W/LITTLE GRAVEL & SILT
25	0					
30	0					
35	0					
40	0					HARD SHALE AT 39.8', REFUSAL
						END OF BORING



E1370911

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

DRILLER: BUFFALO DRILLING
GEOLOGIST: J. BYRD
WORK ORDER: 137-09
CLIENT: ALCOA, INC.
DATE COMPLETED: 9-29-00
LOCATION: 1116 E. STATE ST.
METHOD: GEOPROBE
OLEAN, NY

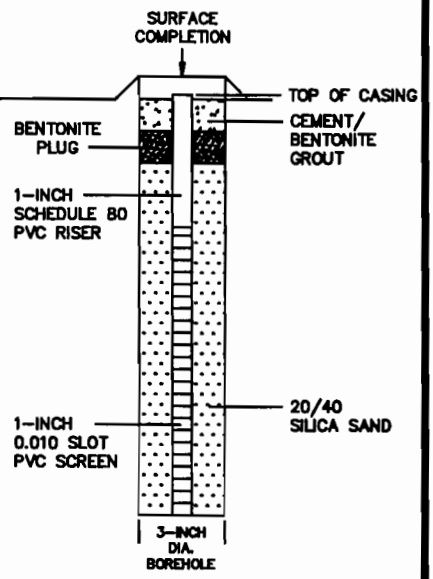
NOTES:

LOCATION

SOIL BORING RU-12

MONITOR WELL RU-12

DEPTH, FT.	OVA, PPM	SAMPLE	CORE	INTERVAL	MATERIAL	DESCRIPTION
0	0					SANDY LEAN CLAY, SOFT W/ROOTS & SMALL GRAVEL, GRASS AT SURFACE
						TAN W/IRON STAINING & ROOT TRACES
5	0					SANDY LEAN CLAY, GRAY
						INCREASING SILT, GRAY W/SHALE AT 7'
						VERY MOIST ▼
10	0					CLAY SAND, FIRM OLIVE TAN W/SILT & GRAVEL
						INCREASING GRAVEL SIZE W/DEPTH
15	0					
20	0					
25	0					COARSE SAND & GRAVEL, BROWN & TAN
	0					
	0					END OF BORING
30						



E1370919

ENVIRONEERING, INC.

BORING LOG

ALCAS CUTLERY FACILITY
OLEAN, NY

DRAWN BY:	DATE:	PROJ. NO.
LMG	1-25-01	137-09

APPENDIX B

GEOTECHNICAL LABORATORY RESULTS

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV1-SL-0102	36	12	88	82	72	50	9	CL
RV1-SL-0405	29	11	81	78	72	52	12	CL
RV1-SL-0910	23	6	70	52	23	8	7	SW-SC
RV1-SL-1213	20	5	81	75	64	46	10	SC-SM
RV1-SL-2122	Non - Plastic		31	26	18	12	–	GC-GM
RV1-SL-2526	26	9	73	68	58	48	12	SC-SM
RV1-SL-3132	26	9	77	71	61	50	13	CL
RV2-SL-0102	Non - Plastic		34	28	21	9	–	GP-GC
RV2-SL-0506	32	14	56	31	21	7	7	SP-SC
RV2-SL-0910	24	7	100	98	85	77	8	CL-ML
RV2-SL-1314	26	9	85	78	66	54	12	CL-ML
RV2-SL-2526	25	10	82	74	64	52	14	CL-ML
RV2-SL-3233	Non - Plastic		46	33	18	8		GP-GC

Sample Identification	Sample Description	Grain Size
RV1-SL-0102	Sandy lean clay, olive gray w/ gravel	Plate 8
RV1-SL-0405	Sandy lean clay, brown and olive gray w/ gravel and ferrous nodules	Plate 8
RV1-SL-0910	Well graded sand, olive gray w/ clay pockets and gravel	Plate 8
RV1-SL-1213	Silty, clayey sand, olive gray w/ gravel	Plate 8
RV1-SL-2122	Silty, clayey gravel, olive gray w/ sand	Plate 8
RV1-SL-2526	Clayey sand, olive gray w/ gravel	Plate 8
RV1-SL-3132	Sandy lean clay, olive gray w/ gravel	Plate 8
RV2-SL-0102	Poorly graded gravel, brown w/ silty clay and sand	Plate 9
RV2-SL-0506	Poorly graded sand, olive gray w/ clay and gravel	Plate 9
RV2-SL-0910	Sandy silty clay, olive gray	Plate 9
RV2-SL-1314	Sandy lean clay, olive gray w/ gravel	Plate 9
RV2-SL-2526	Sandy lean clay, olive gray w/ gravel	Plate 9
RV2-SL-3233	Poorly graded gravel, olive gray w/ silty clay and sand	Plate 9

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV3-SL-0203	Non - Plastic		94	90	81	58	10	CL-ML
RV3-SL-0506	Non - Plastic		85	79	68	51	7	CL-ML
RV3-SL-0809	27	12	68	53	35	26	7	SC
RV3-SL-1314	24	9	81	75	65	51	13	CL-ML
RV3-SL-1920	Non - Plastic		48	37	22	14	–	GM
RV3-SL-2425	27	10	81	74	64	55	14	CL-ML
RV3-SL-2627	27	9	87	81	66	57	13	CL-ML
RV4-SL-0102	24	8	94	89	80	54	12	CL
RV4-SL-0506	29	9	88	83	72	55	13	CL
RV4-SL-1415	Non - Plastic		64	59	53	35	6	SC
RV4-SL-1617	Non - Plastic		68	62	52	43	11	SC-SM
RV4-SL-1819	26	6	89	79	66	56	6	CL
RV4-SL-2829	Non - Plastic		42	30	14	5	–	GW-GM

Sample Identification	Sample Description	Grain Size
RV3-SL-0203	Sandy silty clay, olive gray w/ gravel	Plate 10
RV3-SL-0506	Sandy silty clay, olive gray w/ gravel	Plate 10
RV3-SL-0809	Clayey sand, olive gray w/ gravel	Plate 10
RV3-SL-1314	Sandy lean clay, olive gray w/ gravel	Plate 10
RV3-SL-1920	Silty gravel, brown w/ sand	Plate 10
RV3-SL-2425	Sandy lean clay, olive gray w/ gravel	Plate 10
RV3-SL-2627	Sandy lean clay, olive gray w/ gravel	Plate 10
RV4-SL-0102	Sandy lean clay, brown	Plate 11
RV4-SL-0506	Sandy lean clay, brown	Plate 11
RV4-SL-1415	Clayey sand, brown w/ gravel	Plate 11
RV4-SL-1617	Silty, clayey sand, olive gray w/ gravel	Plate 11
RV4-SL-1819	Gravelly lean clay, brown w/ sand	Plate 11
RV4-SL-2829	Well graded gravel, brown w/ clay and sand	Plate 11

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV5-SL-0203	26	7	90	88	83	49	10	CL-ML
RV5-SL-0809	28	12	85	78	68	56	15	CL
RV5-SL-1617	Non - Plastic		38	24	10	6	–	GW-GC
RV5-SL-1718	25	9	88	73	62	54	14	CL
RV6-SL-0102	Non - Plastic		46	36	21	11	–	GW-GM
RV6-SL-0506	Non - Plastic		92	91	88	71	4	CL-ML
RV6-SL-1112	23	8	87	80	68	51	11	CL
RV6-SL-1213	22	7	81	74	64	48	10	SC-SM
RV6-SL-2021	Non - Plastic		100	99	98	76	5	CL-ML
RV6-SL-2122	27	9	73	64	53	45	10	SC

Sample Identification	Sample Description	Grain Size
RV5-SL-0203	Sandy silty clay, red	Plate 12
RV5-SL-0809	Sandy lean clay, gray	Plate 12
RV5-SL-1617	Well graded gravel, olive gray w/ clay and sand	Plate 12
RV5-SL-1718	Sandy lean clay, gray	Plate 12
RV6-SL-0102	Well graded gravel, brown w/ silt and sand	Plate 13
RV6-SL-0506	Sandy silty clay, brown	Plate 13
RV6-SL-1112	Sandy lean clay, gray	Plate 13
RV6-SL-1213	Silty, clayey sand, gray w/ gravel	Plate 13
RV6-SL-2021	Sandy silty clay, brown	Plate 13
RV6-SL-2122	Clayey sand w/ gravel, olive gray	Plate 13

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV7-SL-0102	33	15	100	100	100	99	18	CL
RV7-SL-0910	Non - Plastic		97	96	94	61	4	CL
RV7-SL-1314	23	7	83	74	63	48	10	SC-SM
RV7-SL-1718	25	11	85	79	70	55	14	CL
RV7-SL-2425	25	8	58	45	30	23	4	SC-SM
RV8-SL-0203	29	8	96	92	85	52	9	CL
RV8-SL-0910	Non - Plastic		81	76	66	42	3	SM
RV8-SL-1213	Non - Plastic		82	71	57	40	5	SC-SM
RV8-SL-1617	Non - Plastic		64	52	40	28	3	SC
RV8-SL-1819	26	10	100	100	100	96	21..2	CL

Sample Identification	Sample Description	Grain Size
RV7-SL-0102	Silty lean clay, red	Plate 14
RV7-SL-0910	Sandy lean clay, red	Plate 14
RV7-SL-1314	Silty, clayey sand, gray w/ gravel	Plate 14
RV7-SL-1718	Sandy lean clay, brown w/ gravel	Plate 14
RV7-SL-2425	Clayey sand, olive gray w/ gravel	Plate 14
RV8-SL-0203	Sandy lean clay, red	Plate 15
RV8-SL-0910	Silty sand, red w/ gravel	Plate 15
RV8-SL-1213	Silty, clayey sand, brown w/ gravel	Plate 15
RV8-SL-1617	Clayey sand, gray w/ gravel	Plate 15
RV8-SL-1819	Sandy lean clay, olive gray	Plate 15

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV9-SL-0203	28	8	100	100	99	68	12	CL
RV9-SL-0607	Non - Plastic		96	96	94	21	4	SC-SM
RV9-SL-1213	Non - Plastic		70	56	38	22	3	SC-SM
RV9-SL-1516	32	12	100	100	99	97	30	CL
RV10-SL-0102	32	10	100	99	94	59	13	CL
RV10-SL-0708	Non - Plastic		100	99	88	13	2	SC-SM
RV10-SL-1617	21	3	97	94	91	62	8	CL

Sample Identification	Sample Description	Grain Size
RV9-SL-0203	Sandy lean clay, brown	Plate 16
RV9-SL-0607	Silty, clayey sand, red	Plate 16
RV9-SL-1213	Silty, clayey sand, red w/ gravel	Plate 16
RV9-SL-1516	Sandy lean clay, red	Plate 16
RV10-SL-0102	Sandy lean clay, red	Plate 17
RV10-SL-0708	Silty, clayey sand, red	Plate 17
RV10-SL-1617	Sandy lean clay, red	Plate 17

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
RV11-SL-0203	25	7	100	99	87	61	16	CL
RV11-SL-0405	24	6	94	90	82	41	10	SC-SM
RV11-SL-1011	Non - Plastic		99	98	98	92	7	CL
RV11-SL-1617	Non - Plastic		66	56	45	32	7	SC
RV11-SL-2223	23	8	87	81	70	54	11	CL
RV12-SL-0203	32	13	100	99	97	73	19	CL
RV12-SL-0506	Non - Plastic		97	95	93	50	6	CL
RV12-SL-0910	26	9	88	71	51	40	11	SC

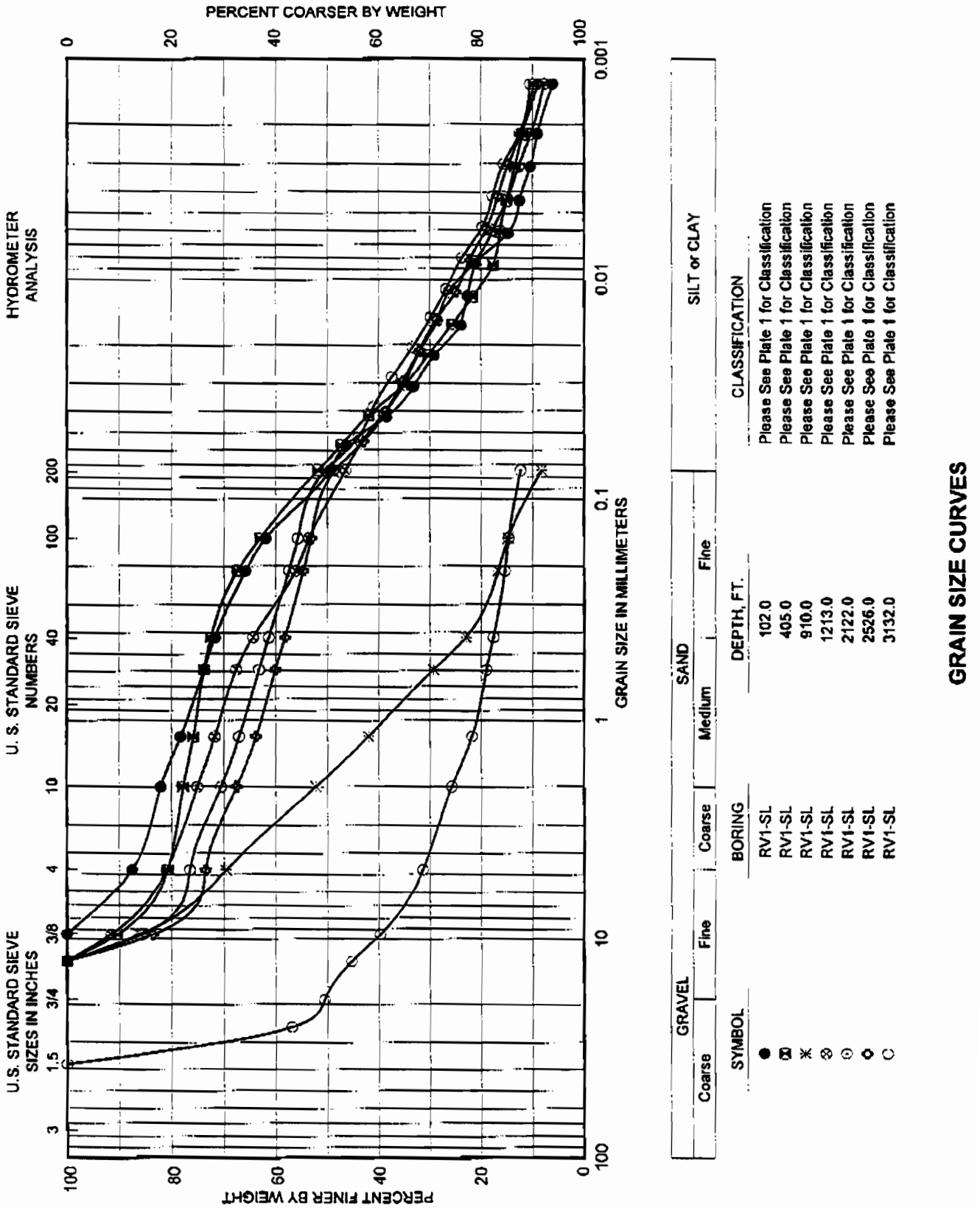
Sample Identification	Sample Description	Grain Size
RV11-SL-0203	Sandy lean clay, brown	Plate 18
RV11-SL-0405	Silty, clayey sand, red	Plate 18
RV11-SL-1011	Sandy lean clay, brown	Plate 18
RV11-SL-1617	Clayey sand, olive gray w/ gravel	Plate 18
RV11-SL-2223	Sandy lean clay, olive gray	Plate 18
RV12-SL-0203	Sandy lean clay, olive gray w/ organics	Plate 19
RV12-SL-0506	Sandy lean clay, brown	Plate 19
RV12-SL-0910	Clayey sand, gray	Plate 19

SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES

Sample Identification	INDEX OR PHYSICAL PROPERTY TEST							USCS Group Symbol
	Liquid Limit, LL	Plasticity Index, PI	Passing No. 4 Sieve (%)	Passing No. 10 Sieve (%)	Passing No. 40 Sieve (%)	Passing No. 200 Sieve (%)	Finer 0.002 mm (%)	
ENI1-SL-0102	26	8	100	99	96	71	15	CL
ENI1-SL-0809	23	8	83	76	64	50	13	CL
ENI1-SL-1920	23	8	85	80	69	52	12	CL
ENI1-SL-2425	25	7	89	80	61	49	10	SC-SM
ENI1-SL-2526	Non - Plastic		57	52	40	17	–	SC-SM
ENI1-SL-3031	24	7	83	75	62	50	10	CL

Sample Identification	Sample Description	Grain Size
ENI1-SL-0102	Sandy lean clay, red w/ ferrous stains	Plate 20
ENI1-SL-0809	Sandy lean clay, gray w/ gravel	Plate 20
ENI1-SL-1920	Sandy lean clay, gray w/ gravel	Plate 20
ENI1-SL-2425	Silty, clayey sand, brown	Plate 20
ENI1-SL-2526	Silty, clayey sand, brown w/ gravel	Plate 20
ENI1-SL-3031	Sandy lean clay, gray w/ gravel	Plate 20

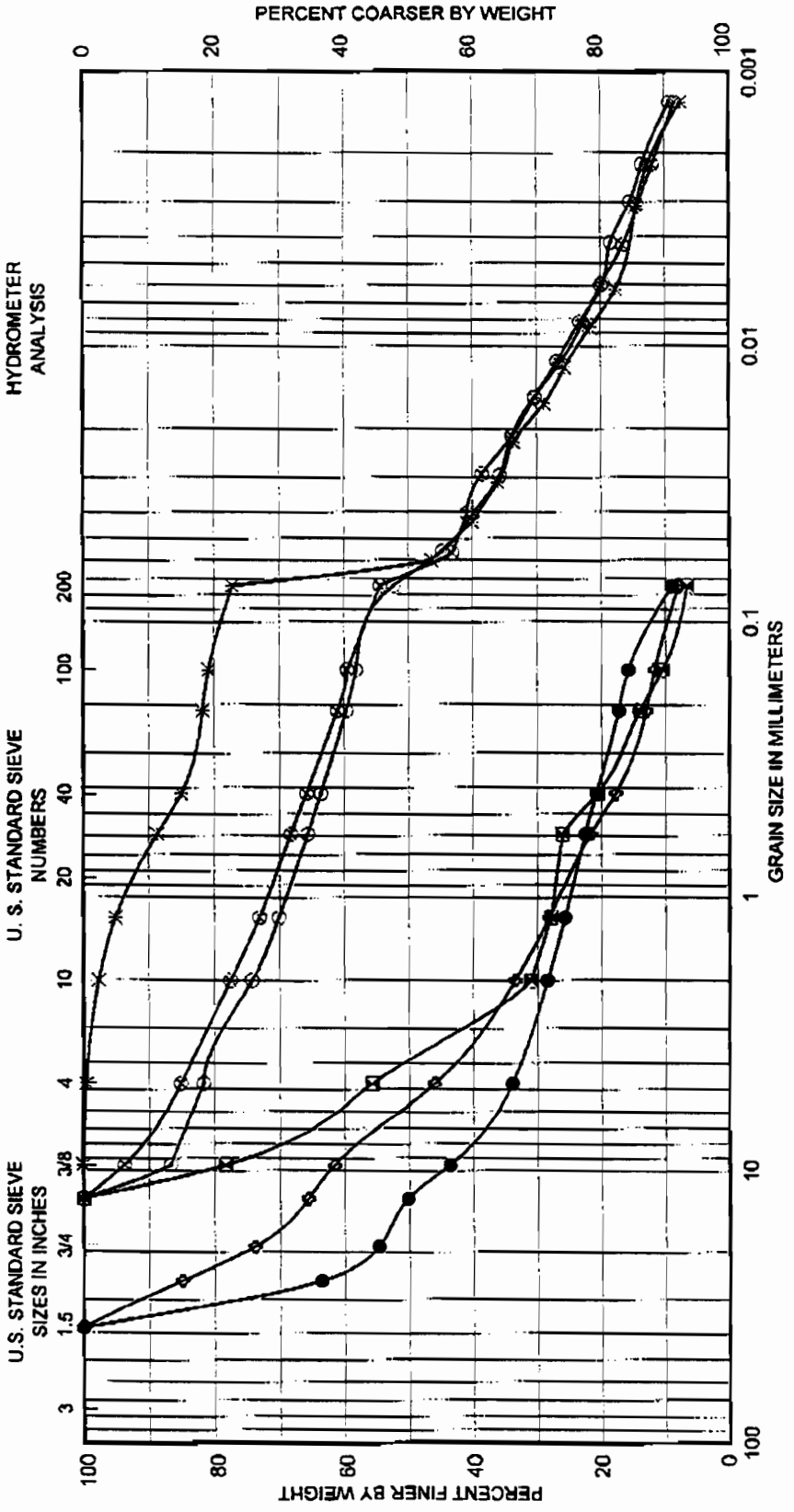
SUMMARY OF SELECTED INDEX AND PHYSICAL PROPERTIES



GRAIN SIZE CURVES

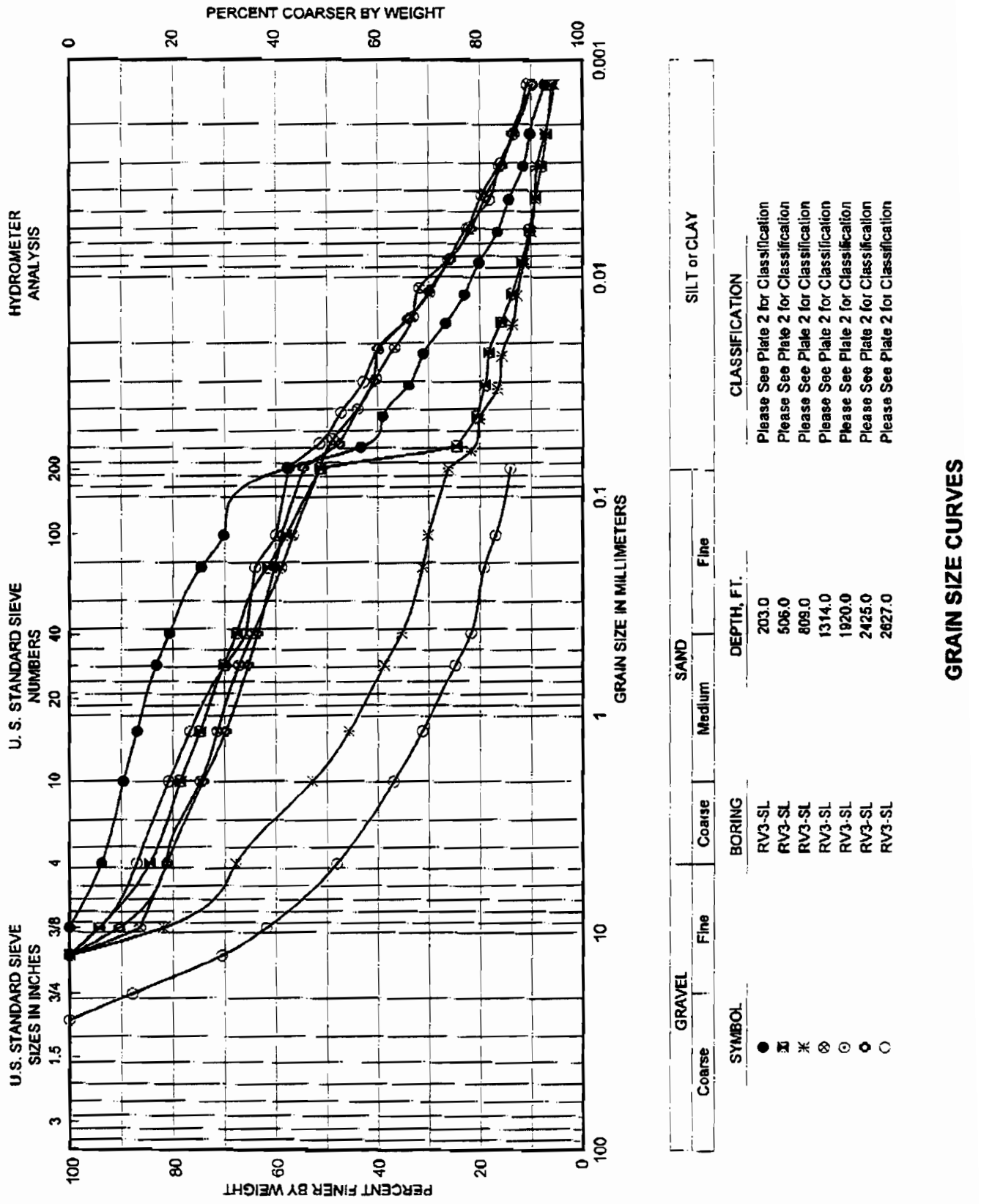
PLATE 8

Report No. 0401-1333



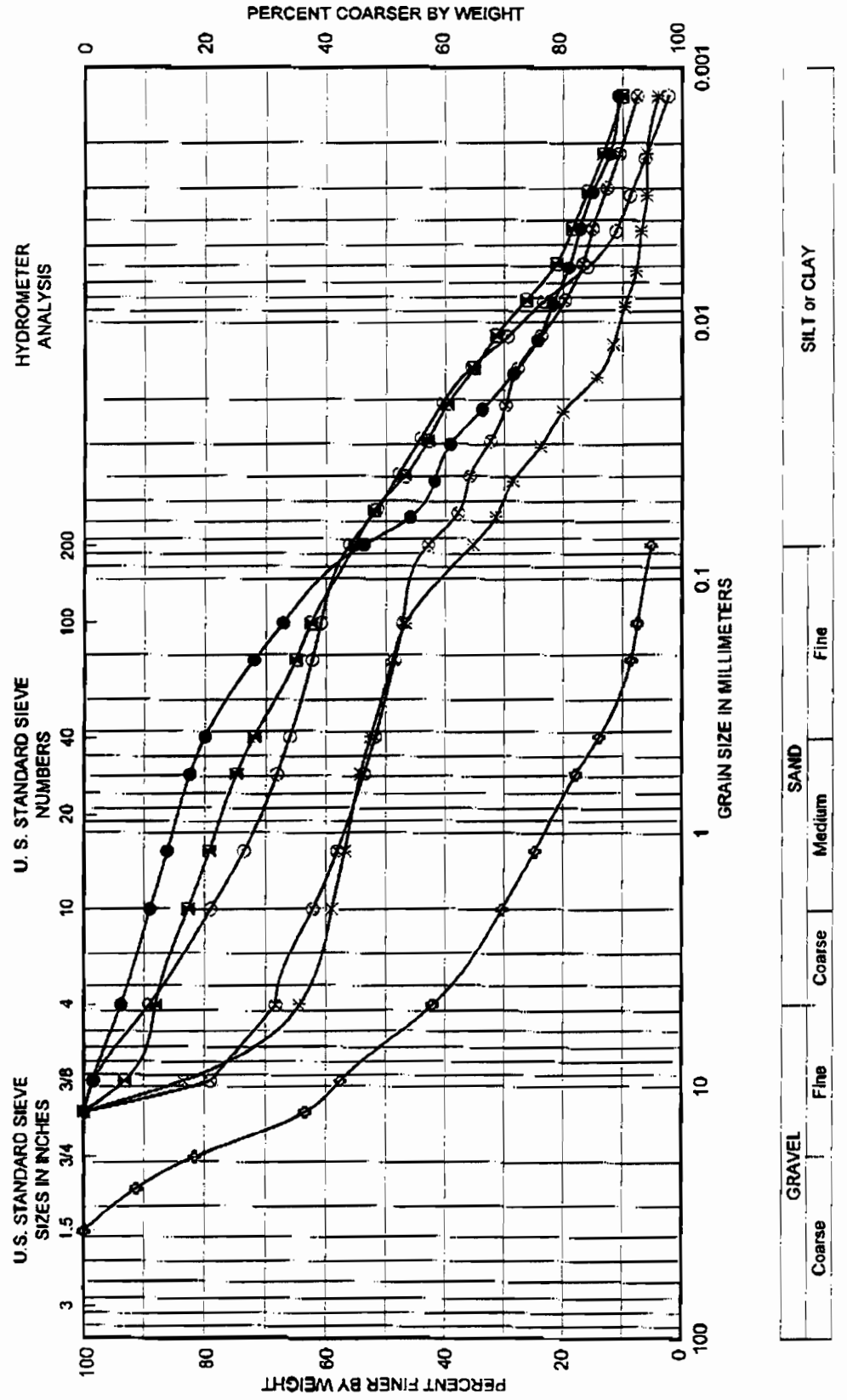
GRAIN SIZE CURVES

PLATE 9



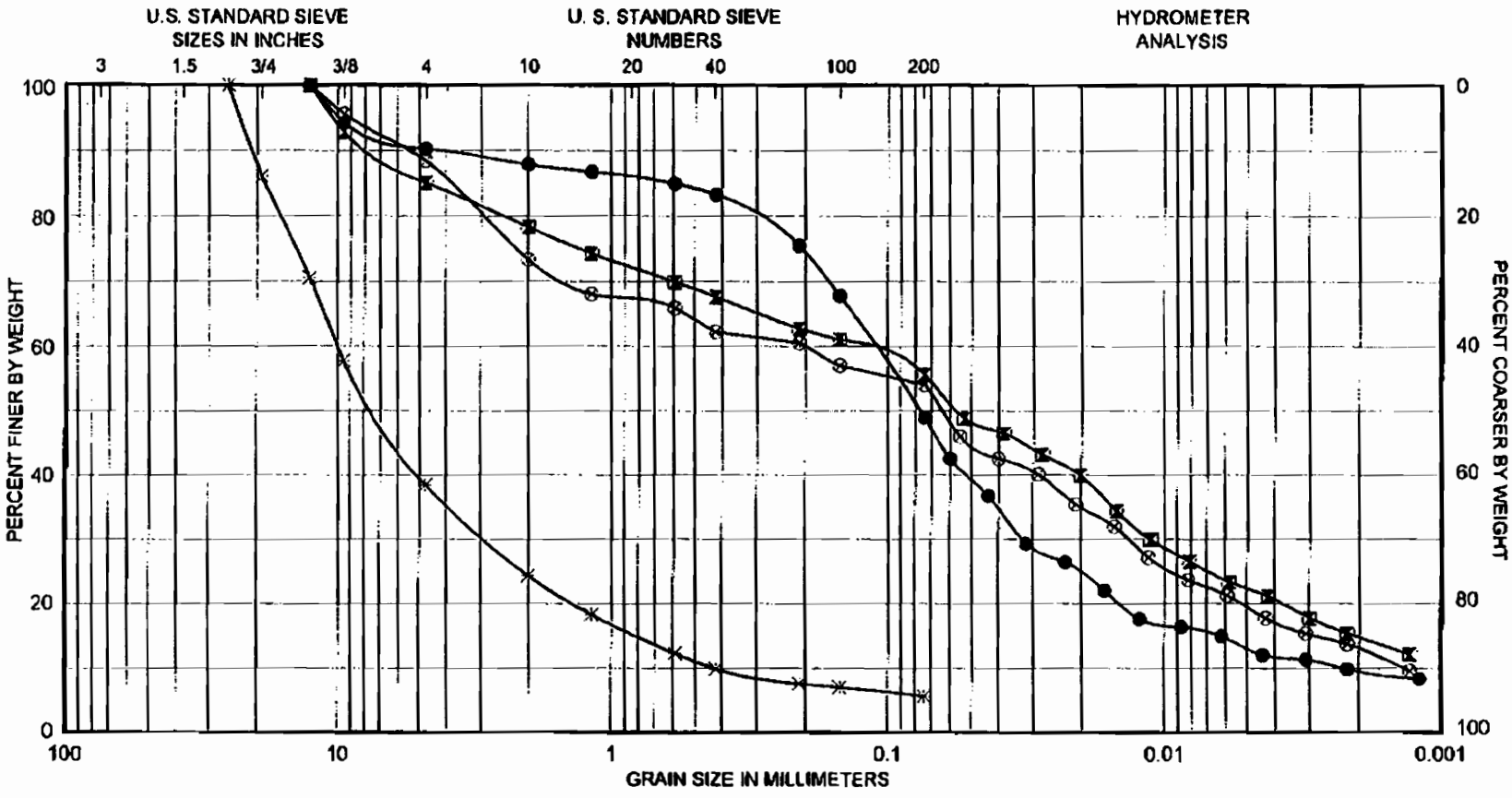
GRAIN SIZE CURVES

PLATE 10



GRAIN SIZE CURVES

PLATE 11

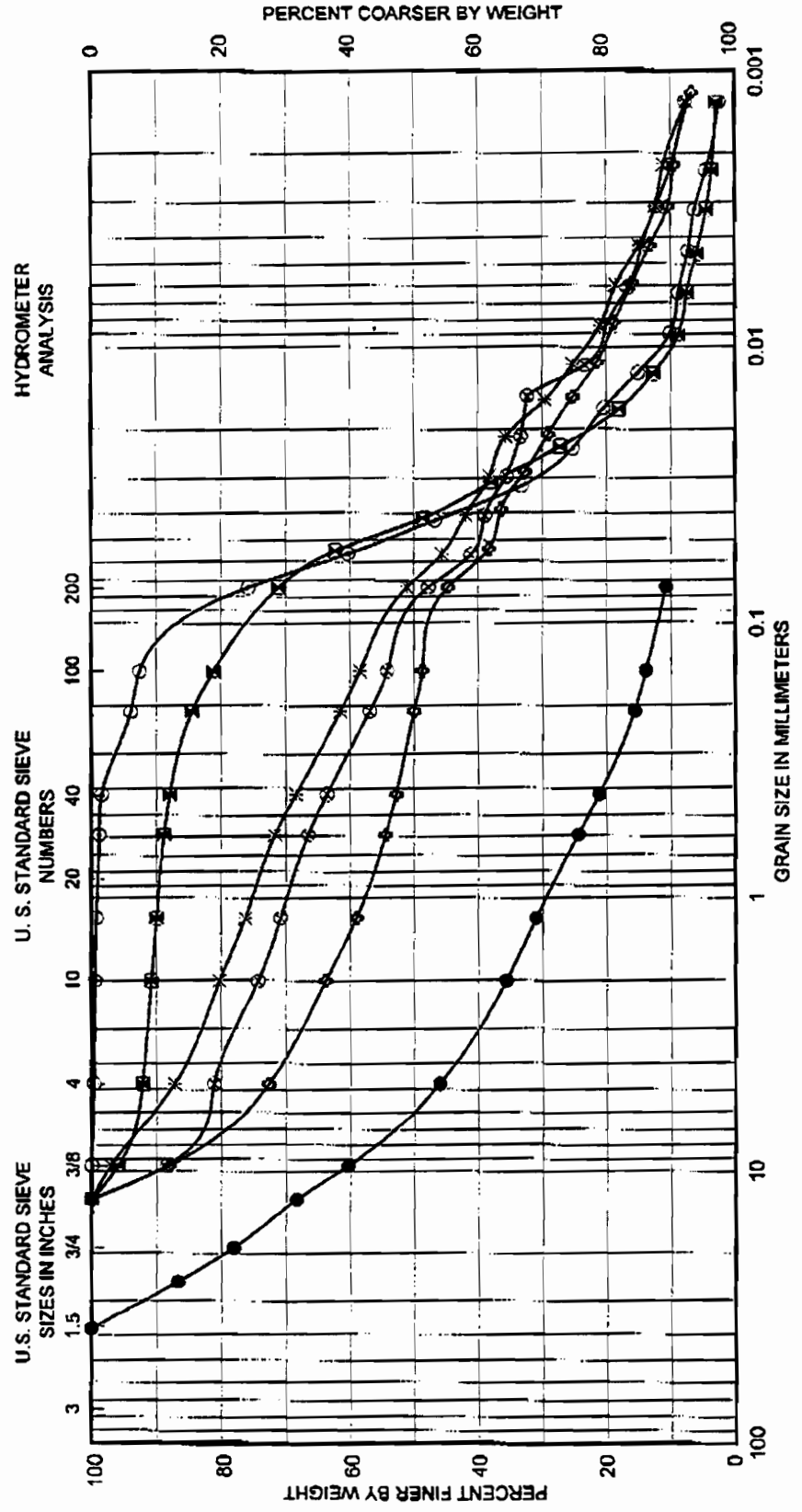


GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

SYMBOL	BORING	DEPTH, FT.	CLASSIFICATION
●	RV5-SL	203.0	Please See Plate 3 for Classification
⊠	RV5-SL	809.0	Please See Plate 3 for Classification
✳	RV5-SL	1617.0	Please See Plate 3 for Classification
⊗	RV5-SL	1718.0	Please See Plate 3 for Classification

GRAIN SIZE CURVES

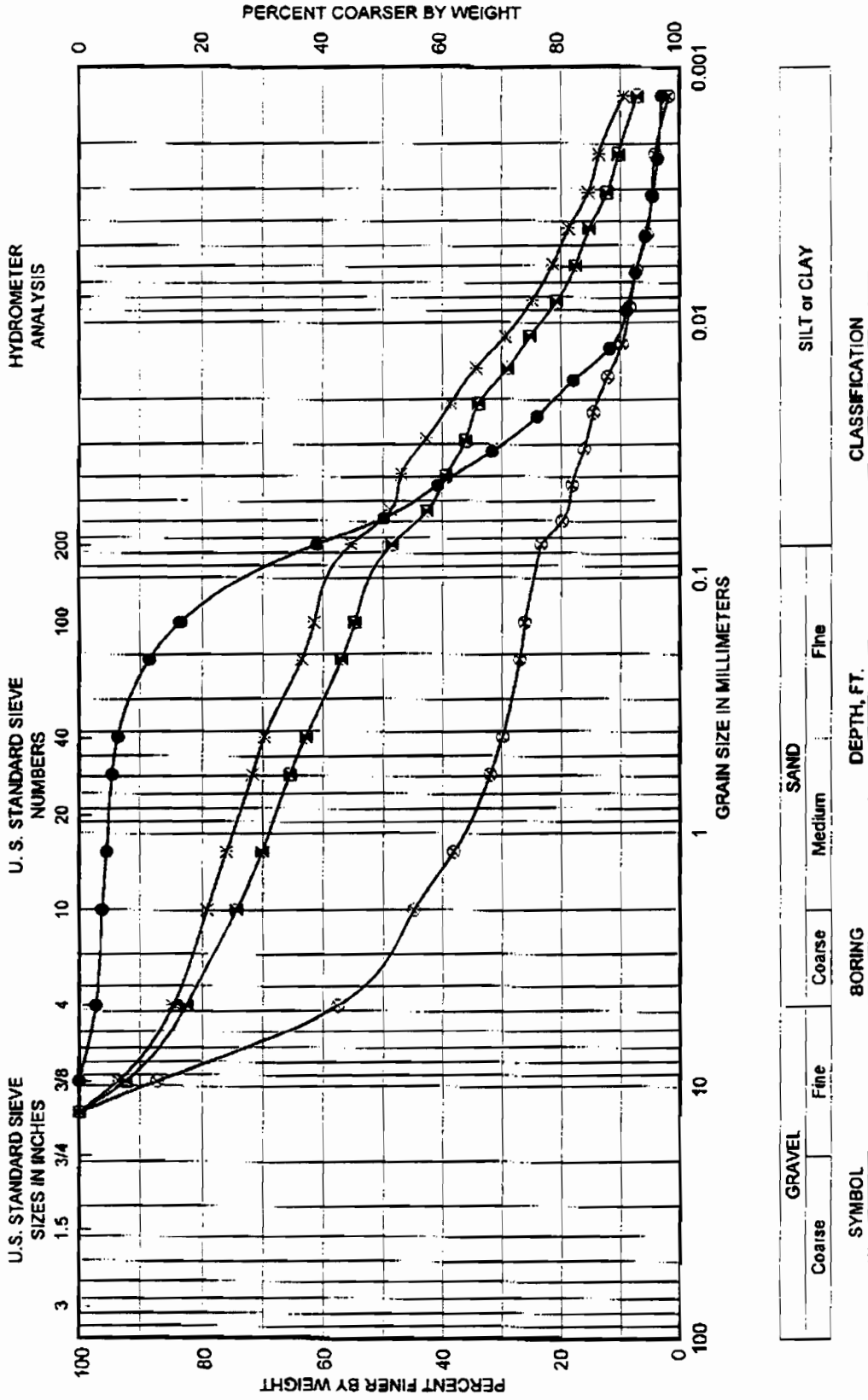
PLATE 12



GRAIN SIZE CURVES

PLATE 13

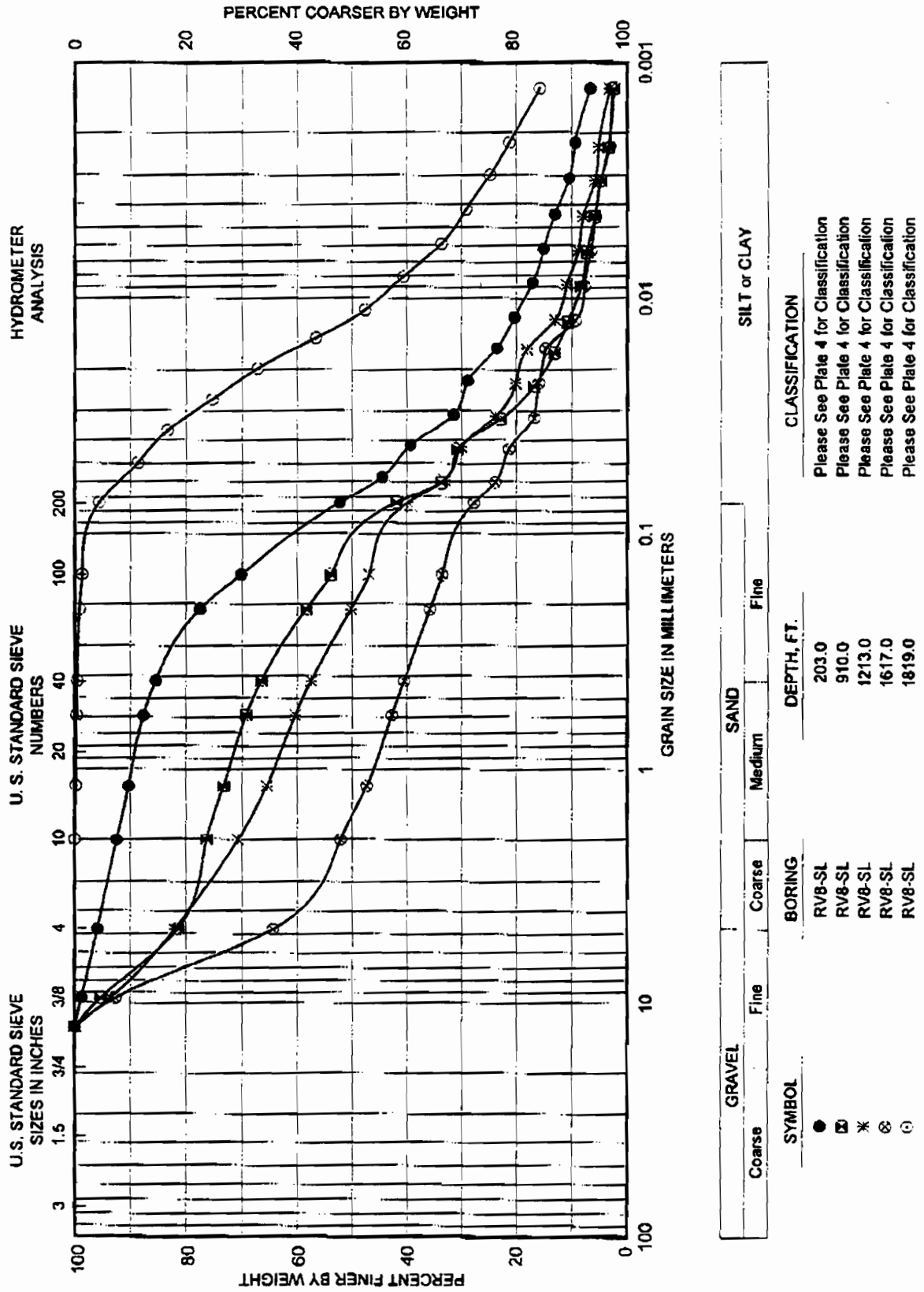
Report No. 0401-1333



GRAIN SIZE CURVES

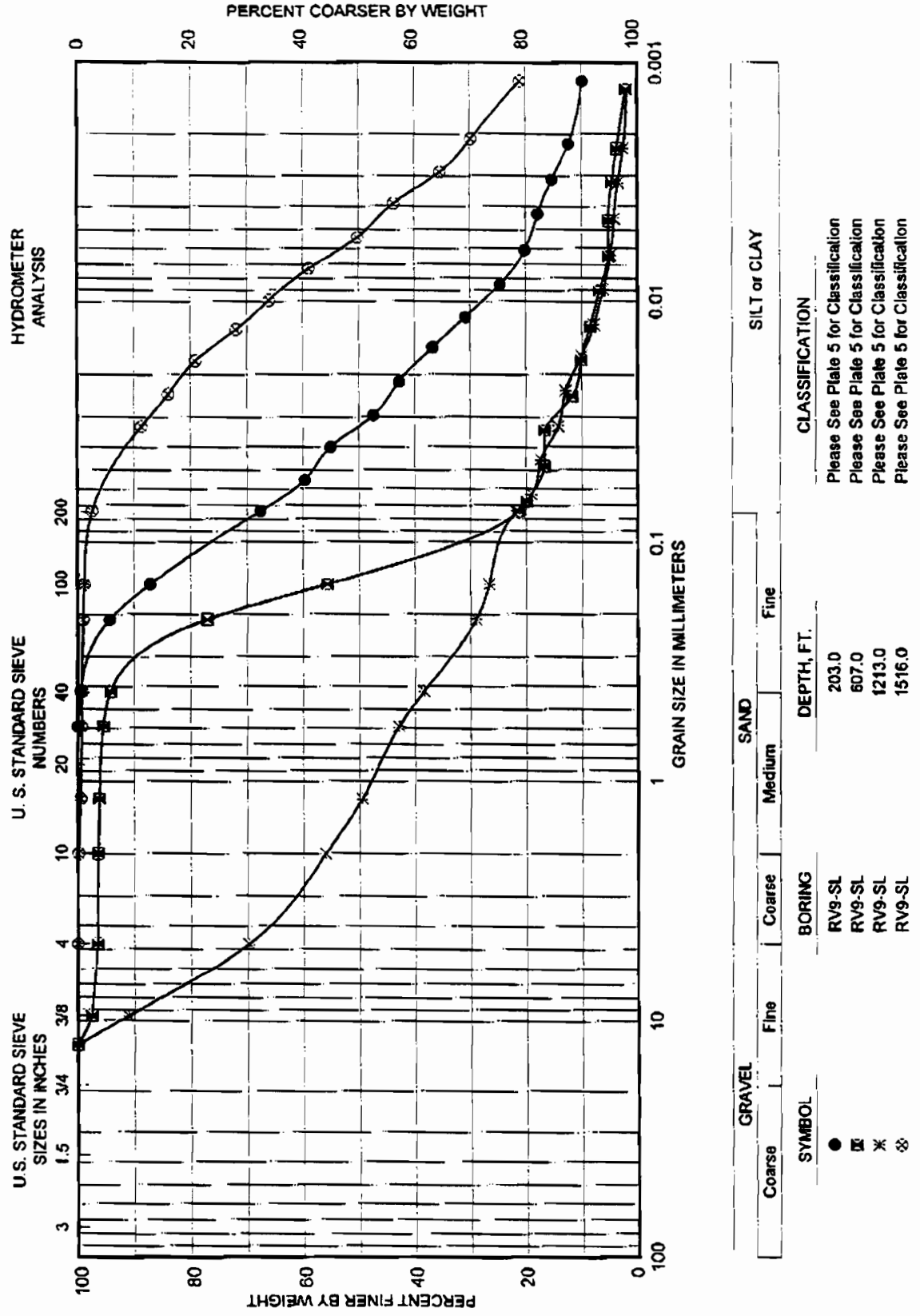
PLATE 14

Report No. 0401-1333



GRAIN SIZE CURVES

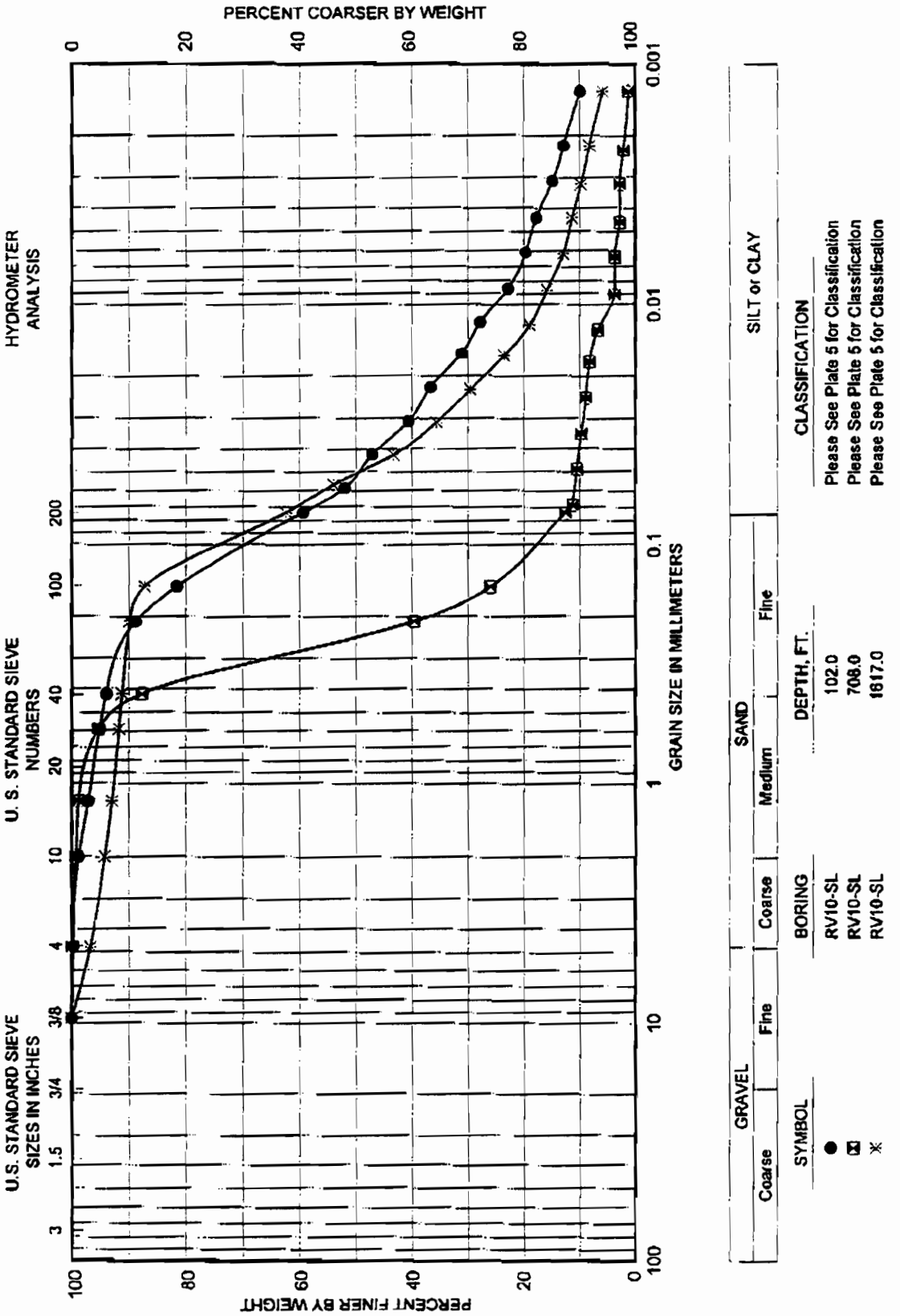
PLATE 15



GRAIN SIZE CURVES

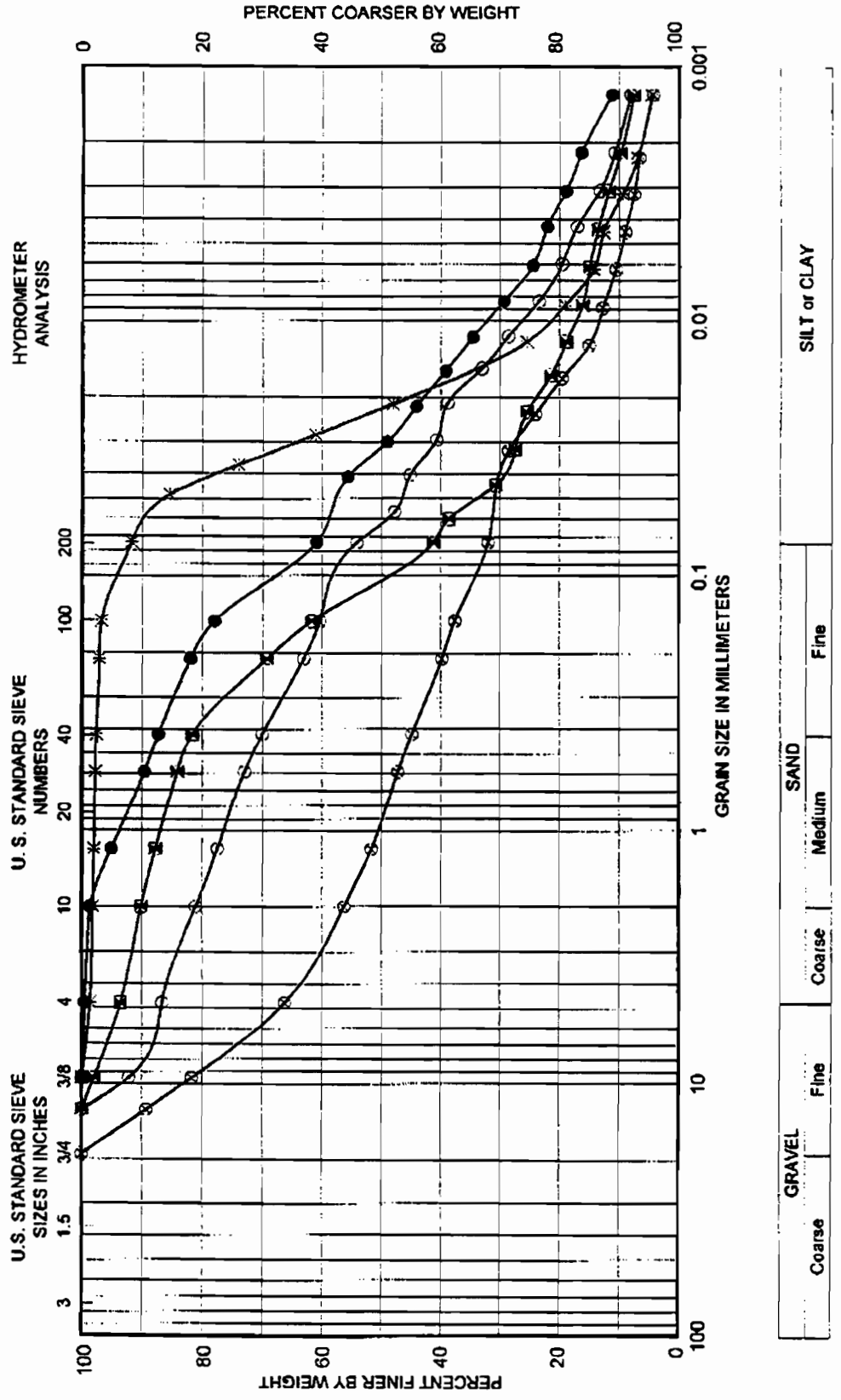
PLATE 16

Report No. 0401-1333



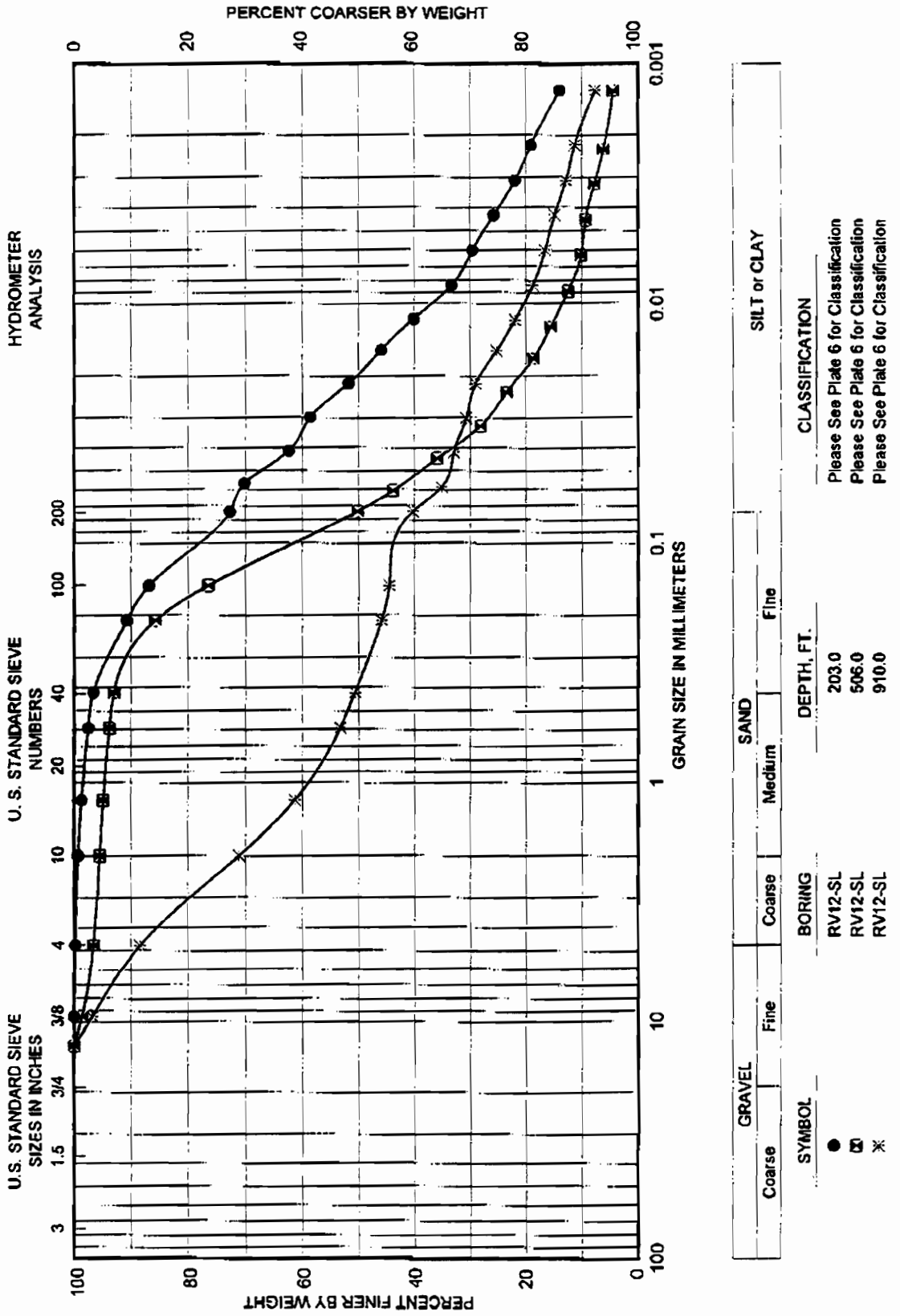
GRAIN SIZE CURVES

PLATE 17



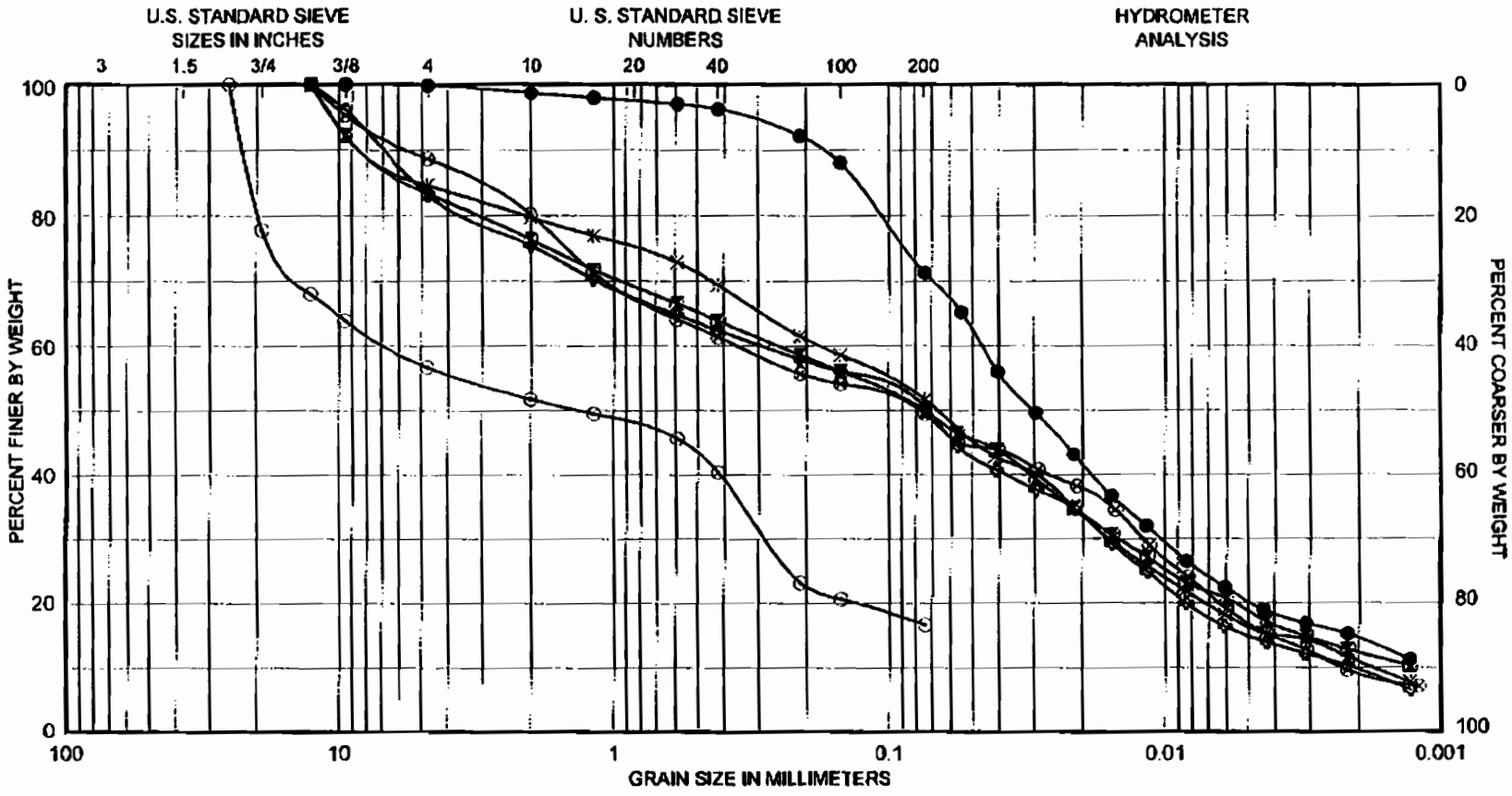
GRAIN SIZE CURVES

PLATE 18



GRAIN SIZE CURVES

PLATE 19



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

SYMBOL	BORING	DEPTH, FT.	CLASSIFICATION
●	ENI1-SL	102.0	Please See Plate 7 for Classification
⊠	ENI1-SL	809.0	Please See Plate 7 for Classification
✕	ENI1-SL	1920.0	Please See Plate 7 for Classification
⊗	ENI1-SL	2425.0	Please See Plate 7 for Classification
⊙	ENI1-SL	2526.0	Please See Plate 7 for Classification
◇	ENI1-SL	3031.0	Please See Plate 7 for Classification

GRAIN SIZE CURVES

PLATE 20

APPENDIX C

FIELD NOTES

9/25/00 137-08 JBy/d

1116 E. State St.

Cutco Cutlery Corp.

0830 arrive @ site w/ Sean Flannigan
meet w/ Carey Litteer
(V.P. & Technical manager)
Discuss Location of RW-5
well to be placed in building
He shows us location &
what he wants done (dust
control)
We ask for location to place
decon pad & waste drums
He wants them placed on
the south side of the plant
10:00 walk property to locate
locations of wells
Weather: Partly cloudy & 60°

JBy/d

137-08 9/25/00 Byrd

Cotco Cothery Corp

1030 Meet w/ Mr. Bailey Property Owner Located South + west of Cotco He walkes us through his property + were the wells will be placed we explained we would minimize site traffic w/ only one truck entering He appeared satisfied + didn't care when we started.

11:00 go to Hardware store for supplies for staff gauge weather: warmer

12:00 leave for Lunch

13:00 Drillers @ site Have difficulty finding them

Byrd

137-08 9/25/00 Byrd

1315 call Buffalo drilling they would contact driller was informed by L. Crouch that they did not have a grout pump + that one would be shipped as soon as possible

1330 check in w/ office we needed a copy of Health + Safety plan faxed to us.

1400 Return to Mr Baileys property to install staff gauge

1500 meet w/ drillers they begin to set up decon pad they have required PPE (shoes, hat, gloves + Tyvek)

Byrd

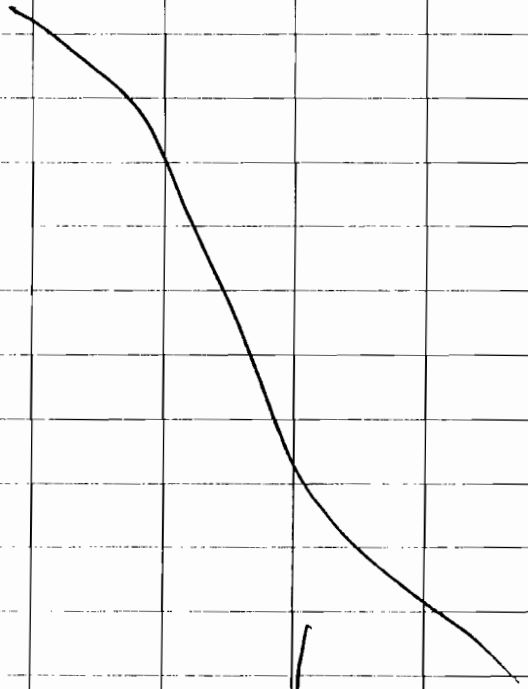
137-08 9/25/00 Byrd

Cutco Cutlery Corp.

1530 Return to Mr. Baileys

Weather: ~60° overcast, light wind from South

1800 Leave Mr. Bailey after talking to him for ~½ hour.



Byrd

9/26/00 137-08 SSF 5

1116 E. State St., CUTCO CUTLERY CORP

07:00 Arrive @ site, Buffalo Drilling is present Don Morris, Ted Bistoff Jeff Byrd and Shawn Flannigan (ENVIRONEERING) ON SITE

Weather conditions 49° F
Overcast with light drizzle
No wind, light breeze out NW
PID background - 0 ppm

07:10 Jeff Byrd conducted safety meeting. Topics discussed PPE, Chemicals of Concern - Chlorinated Solvents

PPE - hard hat, safety glasses, Tyvek, gloves, rubber boots. Keep horseplay to minimum, and no eating, drinking in

9/26/00 137-08 SSF

exclusion or contaminant reduction zones

07:35 START to prepare for drilling activities. Decon Sample barrels Alconox soln.

08:00 Begin to core drill through concrete @ RU 4

08:15 Mr. Corey Litzer (CUTCO) arrived @ location, showed Jeff and shown personal facilities. Mr. Litzer asked why we did not start with RU-5 Measurment of entry (8') and width of truck (8') are the same.

SSF

9/26/00 137-08 SSF >

Cutco Cutlery Co. (ALCAS), Olean, NY

08:30 Mr. Litzer showed the sewer and storm lines on west parking area for RU-2.

08:35 Concrete has been cut for RU-4 and begin drilling.

0850 Mr. White (ENVIRONTERRA) called field phone. Is in Houston, could not arrange for flight to Buffalo.

0910 PID reading @ hole 83 ppm @ breathing zone 0 ppm

0920 PID reading in hole 17 ppm breathing zone 0 ppm

SSF

9/26/00 137-08 SSF

ALCAS facility - Olean, NY

1015 Ammonia (anhydrous) chemical bulk delivery LaRoche Industries

10:35 SOS of Olean dropped off 20 yd box, forklift maneuvering box all activity taking place in proximity of drill

Worker observing activity

1050 PID reading in hole 631 ppm and in breathing zone 0 ppm

1110 PID reading in hole 68 ppm and in Breathing zone 0 ppm

SSF

9/26/00 137-08 SSF 9

ALCAS, Olean, NY

1115 Weather change, clouds starting to break (Partly cloudy) light breeze out of NW Temperature 53°F

1200 Finish Drilling

Call ENI - Spoke w/ Takuto & B. Stevens determine to grout hole back to 20' set casing screen to 6' Grout Pump not @ site leave open hole

1215 Call ENVIROENGINEERING, Grout pump still has not arrived. Decission was made to hand trimmy grout.

SSF

9/26/00 137-01 SSF

ALCAS Facility, Olean, NY

1230 Break for Lunch

1330 Lunch over, prepare grout (10-15% Bat). Prepare for grouting hand trimmy,

Weather Conditions:
Partly cloudy, slight breeze out of NW. Temp - 58°F

1345 PID reading in Breathing Zone 0ppm

1415 Call ENI speak w/ Tulkito will start on well RU-6 next - complete RU-4 first

15:40 FINISH DECON, move to RU-7 to avoid having to cut concrete (time).

SSF

9/26/00 137-08 SSF II

Alcas facility, Olean NY

15:45 SPOKE w/ Mr Litee!. Conversed about access to RU-8. We can move Post and replace when done to gain access. (NO TRESPASSING POST)

1550 START TO DRILL RU-7
PID Breathing Zone 0ppm

1630 Mr Prezbindowski (ALCOA) arrive @ site. Discuss status of project.

1728 PID Breathing Zone 0ppm and hole 10ppm

1740 Prepare to set well screen and riser

SSF

9/26/00 137-08 SSF

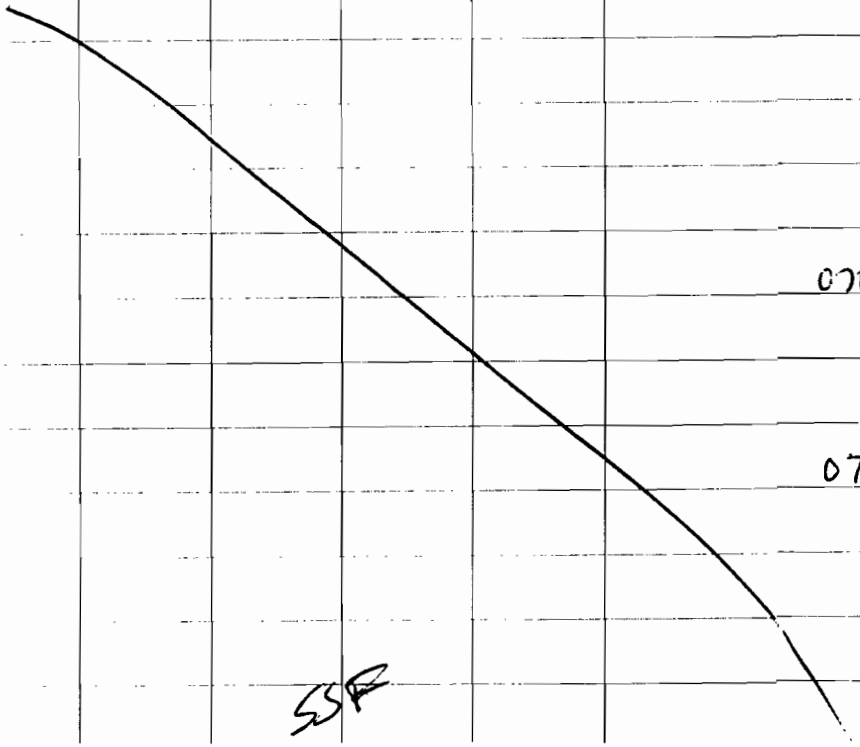
ALCAS Facility, Olean NY

18:00 Bob Prezbandowski leave site

~~drill~~ RU-7 sand and sealed.

1845 Drillers finished and leave site.

SSF



SSF

9/27/00 137-08 SSF 13

ALCAS Facility

1116 E. State St, Olean, N.Y

0700 Arrive @ site, personnel present

Jeff Byrd ENVIRO)

Shawn Flanigan (ENVIRO)

Don Morriss (Buffalo Drill)

Tad Bistoff (Buffalo Drill)

Weather Conditions: Fog

~~NO~~ breeze, temperature 40°F

0710 Drillers decon equipment in water Alconox soln.

0720 Move Rig and Equipment to RU 6. Locate core hole and start cutting concrete.

SSF

9/27/00 137-08 SSF

ALCAS Facility, Olean NY

0730 Weather cond: slight breeze out of NW, temp 40°F Fog beginning to burn off

0740 Lay pallets for drum staging place DOT bung hole diagram on pallet

0800 Core cutting finish through concrete, place Rig start drill @ RU6

0825 PID in Breathing Zone 0ppm and in hole 0ppm

0830 Mr Bob Prezbindowski (ALCOA) arrive @ site

SSF

9/27/00 137-08 SSF 1S

ALCAS facility, Olean NY

0900 Weather: sunny, 44°F slight breeze out of NW. PID in Breathing Zone 0ppm and in hole 0ppm

0920 Finish drilling set screen sand and seal.

1000 Decon drilling Equipment move to RU-3. RU3 location moved from next to road next building Mr. Litteer was consulted no problems or known lines

1045 Start to drill RU3

SSF

9/27/00 137-08 SSF

Alcas facility, Olean, NY

1045 PID reading breathing zone 0 ppm
Weather Cond: Sunny, light breeze NW, 72°F

1130 PID in breathing zone 0 ppm and in hole 0 ppm

1200 PID in breathing zone 0 ppm and in hole 0 ppm

1250 FINISH drilling

1255 leave for Lunch

1355 Return from Lunch, drillers set screen, sand and seal.

SSF

Alcas facility Olean, NY

1430 Weather Cond: Sunny 74°F, slight breeze NW

1440 Sand and sealed well RV3 complete. Decon Drilling Equipment. Delivery of Drums and other supplies.

1530 start drilling EN1-1

1550 PID reading in Breathing Zone 0 ppm and in hole 0 ppm

17:15 Weather, sunny, 67°F Breezy out of NW

SSF

9/27/00 137-08 SSF

Alcas facility, Olean NY

1730 PID reading in breathing Zone 0 ppm, and in hole 0ppm

1150 mr Prezbindowski Leave site grout 40'-4' (EN11).

1800 clean up area, stage drum

1830 Leave Site

SSF

9/28/00 137-08 SSF 19

Alcas facility, Olean, NY

0700 Arrive @ site, drillers present and decon equipment

0730 The Union Safety Representative stopped Don Morris and requested a copy of the results of our analysis.

Present on site

Don Morris, Tecl Bistoff (Buffalo)

Shawn Flannigan, Jeff Byrd (ENVIRONEER INC)

Weather: Cool, Overcast, slight breeze NW, temp 44°F

0740 Begin Calibration Instruments

SSF

7/28/00 137-08 SSF

Alcas facility, Olean NY

0740 Calibration of Turbidemeter

~~HH~~ SSF HANNA Instruments

H193703

pH meter

HANNA Instruments

HI 9024

calibrate on 4.01 std.

read 4.00

calibrate on 10.01 std.

read 10.02

check on std 7 read 7.05

recalibrate on 7.01 STD

read 7.02

recalibrate on 10.01 STD

read 10.03

check calib. on 7.01

read 7.02

SSF

7/28/00 137-08 SSF 21

ALCAS facility, Olean NY

0815 OPEN WELL CAP RU4

0820 S.C. meter readings taken on 9/~~28~~/00

Standard: 50 µS read 374.3 µS

1000 µS read 1018 µS

0830 Bob Frezbndowski arrive @ site.

0835 J. Byrd contact R. Crouch (Buffalo drilling). ~~Bob~~ Don Morris is leaving Friday @ end of day. R. Crouch will get back in touch.

Water leve measurement RU4 (Pre development)

DTB	DTW
18.58	12.56'

SSF

9/28/00 137-08 SSF

ALCAS facility, Olean NY

0900 SET UP Area for development plastic, and equipment ~~at~~ RU4

0930 Pump having some difficulty

0945 water pumping initial reading
pH-11.6, temp 17.5°C
SC 2.57 mS/cm
pump rate 500 ml 1min 36sec

Time	pH	Temp °C	SC (mS)	Turbidity
~~0952~~ ~~1000~~ 1010	11.35	17.5	1.98	30.11
1050	11.29	17.6	1.97	34.00
1105	11.38	17.5	1.76	38.50
1120	11.21	17.5	1.58	38.23
1200	11.00	17.8	1.48	2.4

SSF

9/28/00 137-08 SSF 23

Alcas facility, Olean NY

1220 Discharge container full stop pumping. DTW - 12.62'
Purge Volume discharge 5 gal

1240 Start pumping RU4 check samples
pH - 11.08, temp 17.9°C
SC - 1.42, turbidity - 126

Check calibration on Turbidity, sample visually clear. Calibration procedure resulted in Err 1. Manual had no explanation. Call Milco (Supplier), spoke with Mr. Tim Byers. Went through calibration procedure w/him. Same error measurement. Milco suspects problem w/meter

SSF

9/28/00 137-08 SSF

Alcas, facility, Olean NY

and will send another meter immediately.

Development has been achieved ~~based on~~ once pH and S.C. have been within 10% of previous 3 readings. Water is visually clear artifact free water

1400 Break for Lunch and ~~stop~~ Pickup pumping Equipment.

1430 Return From lunch, Drillers decon equipment. Jeff Byrd went to talk to adjacent property owner about drilling tommorow

1445 Set up RU-4 for development again. Pump rate 500ml in 72 sec

SSF

Alcas facility Olean NY

Time	pH	Temp (°C)	SC. (µS)
1500	10.22	19.7	1335
1508	10.03	19.5	1291
1515	9.89	19.3	1266
1520	9.81	19.3	1250
1525	9.57	19.4	1232
1530	9.51	19.2	1226
1535	9.42	19.2	1222

flowrate 500ml in 1 min 12 sec

Calculate water column and ~~saturated~~ bore volumes using

$V = \pi \left(\frac{ID}{4}\right)^2 \times (DTB - DTW)$

DTB - depth to bottom
DTW - depth to water

$V = WWC$

Calculate Saturated bore Volume

$= WWC + ((BWC - WWC) * \overset{0.3}{\cancel{0.03}})$

WWC = well water Volume
BWC = Bore water Volume
* assume 30% porosity (0.3)

SSF

9/28/00 137-08 SSF

Alcas facility, Olean NY

Well completed pH, temp, SC <10% over 3 consecutive Saturated boring Volumes

1610 Start pumping RU-4 again Increase pump flowrate to 500 ml in 48 sec

Time	pH	Temp(Y)	SC (mS)
1615	9.24	19.2	1234
1625	9.21	19.1	1236
1632	9.18	19.1	1247

colorless water

1635 STOP Pump, measure RU4 Depth to water (DTW) DTW - 12.59'

16:40 Decon equipment, pack up gear

SSF

9/28/00 137-08 SSF 27

Alcas facility, Olean NY

Total volume of purge water- approximately 9 1/2 gallons

Total purge time approx

1700 completed cleaning RU-4 area.

1710 Join Jeff and Drillers @ RU-2, M. Prezbindowski present.

1720 Investigate No Trespassing sign near RU-8. No problem moving for access

18:20 FINISH Drilling RU-2

SSF

9/28/00 137-08 SSF

Alcas facility, Olean NY

1830 Drillers Decon and store gear & equipment

1900 Leave Job site

SSF

9/28/00 137-08 SSF 29

Alcas facility 1116 East State, Olean NY

0700 Present on site
Don Morriss, Ted Bistoff (Buffalo)
Shawn Flannigan, Jeff Byrd (ENV)

0730 Calibrate instrument

SC

50 μS/cm std. 55.3
read ~~72.2~~ SSF; temp 17.6 °C

1000 μS/cm std.
read 1021 μS/cm @ 16.4°C

pH

STD 7.01 read 7.01
STD 10.01 read 10.03

0740 Set up area for development of RU-7, Unsurp well

9/24/00 137-08 SSF

Alcas facility, Olean NY

0515 Mr Przebindowski arrive

0530 measure depth to water (DTW) and depth to bottom (DTB) at RW7

DTW	DTB
25.37'	27.48'

0900 get tubing in w/hole, pump start. RW7

0923 stop pumping, check water level DTW - 27.15'
DTB - 27.48

0932 DTW - 26.69'

0937 DTW - 26.5

S, F

9/24/00 137-08 SSF 31

Alcas facility, Olean NY

0947 DTW - 26.22

1000 Weather cond: Overcast breeze out of N. temp 38°F
DTW - 25.9

1005 DTW - 25.83

calculate recovery rate
calculate volume recovered

$$V = \frac{\left(\frac{\pi D^2}{4}\right) \times (\text{Depth @ 925} - \text{Depth @ 1005})}{(\text{Time @ start} - \text{time @ recov.})}$$

≈ 1.48 ml/m

1018 DTW - 25.71

1025 DTW - 25.56

9/29/00 137-08 SSF

Alcas facility, Olean NY

1030 DTW - 25.51'

Weather Cond: Mostly Sunny, temp - 42°F, slight breeze out of N

~~to~~ SSF

1038 DTW - 25.45

1047 DTW - 25.44

1052 DTW - 25.4

1055 DTW - 25.32

1056 START PUMPING,

1106 DTW - 27.2

1113 DTW - 26.56

Calculated Saturated Boring Volume (SBV)

SSF

Alcas facility, Olean NY

Use $V = \pi\left(\frac{D^2}{4}\right)(BTB - DTW)$

$V = WWC$ (well water vol.)

$SBV = WWC + [(BWC - WWC) \times .3]$

BWC - Bore water volumn

*assume porosity of 30%

SBV (RU7) = 448 ml

1123 DTW - 26.18

1127 DTW - 26.0

1132 DTW - 25.82

1142 DTW - 25.41

1146 DTW - 25.29

1147 start purging well

SSF

9/29/00 137-08 SSF

Alcas facility, Oleu NY

1157 stop pumping, DTW - 27.16'

1200 Weather Cond: Sunny, slight breeze NW temp 55°F

1207 DTW - 26.32 current recharge rate ≈ 4.5 ml/min

1230 DTW - 24.96 Start pumping

1240 DTW - 27.0, stop pumping

1247 DTW - 26.21

13:00 Break for lunch

13:40 Return from lunch

SSF

Alcas facility, Oleu NY

1340 DTW - 24.71 Start pumping RW7

1350 STOP pumping DTW - 26.93

1358 DTW - 25.92

1412 DTW - 24.81 start pump

1420 STOP Pump, check Parameters DTW - 26.81

pH - 7.29, temp 16.9°C

S.C ~~Turbidity~~ - 628 µS/cm

Turbidity - 101 FTU

1430 DTW - 25.38

1443 DTW - 24.72 Start pump

1445 Check Parameters - S.C - 631 µS pH - 7.24, temp 16.5°C, Turb - 87 FTU

SSF

9/29/00 137-08 SSF

Alcas facility, Olean NY

1451 STOP Pump, DTW - 26.5'

1500 Dan Morris (Buffalo Drill) leave site, replaced w/ Chuck Evingham (Buffalo Drill)

1504 DTW - 25.14

1509 DTW - 24.~~84~~81

1513 Check parameters
S.C. - 629 µS/cm, Temp 16°C
pH - 7.32, Turbidity - 20.61 FTU

1515 stop pump, DTW - 26.97

1529 DTW - 25.06

1537 DTW - 24.71

1540 DTW - 24.68

SSF

Alcas facility, Olean NY

1545 start pump DTW - 24.68

1547 Check parameters
pH - 7.33, Temp 16.0°C
SC - 627 µS/cm, Turb - 43.74 FTU

1550 STOP pump, DTW - 26.95'

1600 Mr. Przebindowski leaves site

1607 DTW - 24.68

1610 start pump
Check parameters at RVT
pH - 7.31, Temp - 15.8°C, SC - 626 µS/cm
Turbidity - 48.76 FTU

1615 DTW - 26.95
Stop pump

1639 DTW - 24.71

SSF

9/29/00 137-08 SSF

Alcas facility, Olean NY

1643 START Pump check parameters
pH-7.41, temp 15.9°C, SC-629 µS
turbidity - 34.74

1649 STOP Pump, DTW - 26.38

1700 STOP development of RU7 for the day. Start cleaning and decon equipment.

1710 Leave Site
SSF

9/30/00 137-08 SSF 39

Alcas facility, 1116 East State St.
Olean, NY

0700 Arrive @ site, check w/ watchman and have him open gates

0720 Drillers start decon, set up RU7 for continued development.

0710 DTW @ RU7 - 24.65

0750 Calibrate instruments
pH - Std. 7.01 read. 7.02
Std. 10.01 read 9.99
Turbidity - std 10.00 read 9.32

SC - 57.4 @ 3.5°C on STD 50µS
999 @ 3.5°C on STD 1000µS
SSF

9/30/00 137-08 SSF

Alcas facility, Olean NY

Present @ site: Jeff Byrd (ENV)
Shaun Flannigan (ENV)
Ted Bistoff (Buf)
Chuck Evinghan (Buf)

Weather cond: Sunny, light breeze out of East, temp 58°F

0830 start pump, ~~the~~ SSF RU7
0836 check parameters
pH - 7.38, temp 11.1°C,
SC - 573 µS/cm, Turb. - 56 Ftu
0840 DTW - 27.06
0853 DTW - 25.54
0900 DTW - 24.98
0905 start pump,
0907 check parameters

SSF

9/30/00 137-08 SSF

Alcas facility, Olean NY

pH - 7.29, temp 11.5°C,
SC - 596 µS/cm, Turb. - 111 Ftu

0930 Check Parameters
pH - 7.33, temp: 11.4°C
SC 586 µS/cm, turb - 11.73 Ftu

pump rate - 500ml/22 min
- 22.7 ml/min

New Saturated boring Volume using
SSF
$V = \pi\left(\frac{D^2}{4}\right)(DTB - DTW)$ SSF

BWVC - well water vol
BWC - boring water vol
Assume 30% porosity
Sat. Bor Vol = WWC + [(BWC - WWC).3]
= 601 ml
Sat bor vol every 26 min

SSF

9/30/00 137-08 55F

Alcas facility, Olean NY

1000 Check parameters RU-7
pH - 7.54, temp - 11.6°C
SC - 597 µS/cm, Turb. - 0.00 FTU

1030 check parameters RU-7
pH - 7.53, temp 11.9°C
SC - 593 µS/cm, Turb - 0.18 FTU
DTW - 26.13, colorless
well parameters are within 10%
well has been developed
purge volume 7.25 l,
approximate time

1055 Set on RU6 for development
Decon equipment. Unclup RU-6

1115 Weather Cond: Temp 60°F, Sunny
~~60~~ 55F Slight breeze of of East
55F

9/30/00 137-01 55F 43

Alcas facility, Olean NY

Measure well depth RU6
DTW - 12.62 DTB 22.91

1120 Start pumping RU-6,
pump rate 500ml/1min 5sec

1130 stop pump, DTW - 12.6

1135 start pump

1145 stop pump, DTW - 12.71

1147 start pump

Calculate Saturated bore volume

Sat. Bore Vol. = 2185 ml
@ 461 ml/min
purge Sat Boro Vol every 4 min
43 sec ≈ 5 min

55F

9/30/00 137-08 SSF

Alcas facility, Olean, NY

1205 check parameters RU6
pH - 7.08, temp - 17.1°C
SC - 887 µS/cm

1230 Stop pump, empty purge water containers.

1235 Start pumping RU6
check parameters: S.C. - 889 µS/cm
pH - 7.04, temp 17.3°C

1245 Stop pump, DTW - 12.69
DTB - 22.91

1250 Break fo lunch

1400 Return From lunch
Weather Cond: Mostly Sunny
breeze out of E., temp 72°F

SSF

9/30/00 137-08 SSF

Alcas facility, Olean NY

1410 Start pump on RU-6

1430 check parameters RU6
pH - 7.06, temp 17.9°C
SC - 870 µS/cm, Tu16 - 22.32 FTU

1440 check parameters RU6
pH - 6.95, temp 17.2°C
SC - 851 µS/cm, Tu/b. - 8.49 FTU
colorless
well parameters are within
10%, turbidity <20 FTU
well is developed
Stop pump.
purge time - 1hr 55 min
purge vol - 9 1/2 gal

SSF

9/30/00 137-08 SSF

Alcas facility, Olean NY

1450 Decon Equipment, clean RU6 area, move equipment to RU3 and Empty remaining purge water.

1520 Setup equipment @ RU3 and prepare for development

1595 Have drillers remove top and place 2" riser.

1620 Take RU3 depth measure.

DTB	DTW
27.57	21.08

1630 Start pump

1635 pump not pumping, remeasure well

SSF

9/30/00 137-08 SSF

Alcas facility, Olean NY

1700 water levels correct, switch to bailer.

1720 bailer not producing any water

1735 switch back to pumping

1755 Stop pump

purge water Volume 130 ml

Start to decon equipment and clean area

1815 Leave site

SSF

10/1/00 137-08 SSF

Alcas facility, 1116 East State Street, Olean, NY

0700 arrive @ site, speak to watchman and have him open gate.

0720 Weather Cond: Foggy, slight breeze ~~blowing~~ east, temp 42°F

0725 Calibrate Instruments
pH - Std 7.01 read 7.03
Std 10.01 read 10.02
SC. - Std 5000 µS read 6.3 (7.6°C)
(8.2°C) Std 1000 µS read 1000
Turb - Std ~~10~~ 10 NTU read 10.2

0730 Driller shawn present @ site
Ted & Chuck (Buf.) Jeff & Stan (ENV)

SSF

10/1/00 137-08 SSF 49

Alcas facility, Olean NY

0800 measure RW3 depth
DTW - 21.08
Water level buzzer intermittent

0830 Start pumping

0840 Stop pump, No measurable water coming out
Start building

0900 check parameters @ RW3
pH - 7.11, temp 20.2°C
SC - 952 µS/cm
Sample Volum 59 ml

0910 let RW-3 recover, decon water level meter

SSF

10/1/00 137-08 SSF

0920 Read depth of water @ RU1

DTW	DTB
14.59	30.27

* well riser 4" above concrete will change measure when flush mount is complete

0930 Discuss RU-3 w/Jeff Byrd. will pump RU-3 for extended time and check parameter.

0940 bail well RU3 one more time ≈ 10 ml water

0950 start pump and let run @ RU3

1015 decon water meter.

SSF

10/1/00 137-08 SSF 51

Alcas facility, Olean NY

1020 Read water depth @ RU2

DTW	DTB
27.46	28.6

1100 Read parameters for RU3

Volume 350 ml

pH - 7.98, temp 20.8

SC - 987 µS

1120 setup RU2 and start pumping

Calculate Saturated bore volume

$$V = \pi\left(\frac{D^2}{4}\right)(DTB - DTW)$$

$$Sat.\ Bore = WWC + [(BWC - WWC)\,0.3]$$

WWC = well water vol.

BWC = Bore water vol

* Assume 30% porosity

SSF

10/1/00 137-08 SSF

Alcas facility, Olean NY

Sat Bore Vol. = 242 ml

RU2 pumprate 500 ml/~~1 min 2 sec~~

= 366 ml/min

∴ every min is 1 sat. bore volume

1135 check RU2 parameters

pH - 7.43, temp 17.2 °C

SC 1184 µS/cm

1138 check parameters RU2

pH - 7.51, temp 16.1°C

SC 1152 µS/cm, turb. 32.36 Ftu

1142 check parameter RU2

pH - 7.48, temp 16.3°C

SC - 1147, turb. - 16.03 Ftu

colorless SSF, ORW - 27.4

10/1/00 137-08 SSF 5 3

Alcas facility, Olean NY

well RU2 parameters are within 10%, turbidity <20 FTU

well RU2 developed

1200 move to RU1 set up for completion

Calculate Sat bore Volume

Sat. Vol = 2905 ml

Drillers (Ted, Chuck) leave Site

1205 start pumping RU1

1222 stop pumping RU1, let recharge return to RU3

Calc. Sat. Bore Vol for RU3

Sat Bore = ~~842 ml~~ SSF 1378 ml

1245 check RU3 parameters, pump on

pH - 7.34 temp 20.4°C

SC - 986 µS, turb. 13.87 Ftu SSF

10/1/00 1327-08 SSF

Alcas facility, Olean NY

Vol from RU3 is 125 ml

1255 pump of @ RU3

1305 pump on @ RU3, ~~clean~~ SSF

1310 Clean RU2, purge volume is ≈ 3½ gallons, purge time 40 min.

1320 Check parameters @ RU3
pH - 7.21, temp 20.9°C
SC - 975 µS/cm Turb. 3.87
Volum of sample 250 ml
colorless well water

1330 start to bail RU1

1345 RU3 parameters are within 10%, turbidity is < 20 FTU well does not produce continuosly, have develop

SSF

10/1/00 1327-08 SSF 55

Alcas facility, Olean NY

for more than 4 hours. Well is considered to be developed

1350 Clean and Decon Equipment @ RU3

1400 start to pump RU1

1450 stop pumping @ RU1
Clean area & decon Equipment

1520 Leave Site

SSF

10/2/00 137-08 SSF

Alcas facility, 1116 East State St.
Olean NY

0700 Arrive on site, check w/Buffalo Drill deconing equipment.

Weather Cond: 42°F, Foggy, very light breeze out of East

Present: Jeff Byrd, Shawn Flanigan, Chuck Eulgham Ted Bisbee getting supplies.

0730 Ted (Buff.) arrive @ site

SSF

10/2/00 137-08 SSF SC SST

Alcas facility, Olean NY

Calibrate instruments

pH - Std 7.01 read 7.01
Std 10.01 read 10.02

Turbidity - Std. 10 FTU
read 9.86 FTU

SC - Std 50µS read 56µS
Std 1000µS read 1000µS

0800 Set up for continued development of RW1

0830 start pumping RW1, DTW - 16.6
weather conditions: Sunny
light breeze out of East
temp 46°F

0900 check RW1 parameters

SSF

10/2/00 137-05 SSF

Alcas facility, Olean NY

RU-1

pH - 7.42, temp 13.8

SC - 1020 µS/cm

0930 Check parameters @ RU1

pH - 8.12, temp 15.1°C

SC - 1010 µS/cm

well appears to be slow to recover

1000 check RU1 parameters

pH - 8.14, temp 17.4°C

SC - 1015 µS/cm, Turb. - 35.70 Ftu

1030 onsite is Don Morris (Buffalo) to replace check transducer (Buffalo). Speak w/ OFF, Tim white, give up date.

SSF

10/2/00 137-08 SSF 59

Alcas facility, Olean NY

1045 check RU1 parameters

pH - 8.10, temp 17.6°C

SC - 1024 µS/cm

turbidity - 17.20 Ftu

1130 check RU1 parameters

pH - 8.13, temp 17.8°C

SC 1025 µS/cm,

turbidity - 19.16 Ftu

1140 Break for Lunch, leave RU1 pumping

1210 Return from Lunch check RU1 parameters

SSF

10/2/00 137-08 SSF

Alcas facility, Olea N4

RU1 parameters: pH - 8.07
temp 17.8°C, SC - 1081 µS/cm
turbidity - 17 ftu, colorless
water, DTW - 29.84
purge vol ~2½ gal, time 5hr 10 min

Stop pumping RU1, developed parameters are 10%, turbidity 420 ftu and continuously pumped for 4 hours

1245 Clean and decon equipment and RU1 area. Move to RU12 and setup

~~1300~~ 1300 SSF Depth measure to RU12

DTB	DTW
13.77	6.88

SSF

10/2/00 137-08 SSF 61

Alcas facility, Olea N4

well riser ≈ 12 inches above grade

1312 start pumping RU12
Calculate Saturated bore Volume - 1463 ml
pump rate - 500ml in 2min 54 sec
~~= 2.87 ml/min~~ SSF
= 172 ml/min
∴ Saturate bore Volume every 8½ mn.

1330 check RU12 parameters
pH - 6.49 temp - 20.1°C
SC - 716 µS/cm

SSF

10/2/00 137-08 SSF

Alcas facility, Olean NY

1340 Check RU12 parameters
pH 6.56, temp 20.1°C
SC 719 µS/cm

1350 Check RU12 parameters
pH- 6.50, temp. 20.1 °C
SC. - 717 µS/cm

1400 Check RU12 parameters
pH-6.49, temp - 19.5°C
SC-708 µS/cm

1410 Check RU12 parameters
pH- 6.48, temp 19.4°C
SC - 714 µS/cm

1430 Empty purge water container
RU12 purge Vol. 4 gal
SSF

10/2/00 Alcas facility, Olean NY

1445 Check RU12 parameters
pH - 6.6, temp 19.7°C
SC - 706 µS/cm
turbidity - 396 Ftu

1500 Check RU12 parameters
pH - 6.67, temp 19.4°C
SC - 703 µS/cm, Turb - 117 Ftu

1510 Check RU12 parameters
pH - 6.55, temp 19.3°C
SC - 708 µS/cm, Turb. - 84 Ftu

1525 Check RU12 parameters
pH - 6.58, temp 19.4°C
SC - 703 µS/cm, Turb. - 39.21

SSF

10/2/00 137-08 SSF

Alcas facility, Olean NY

1540 Check RU12 parameters

pH - 6.68, temp 19.3°C

SC - 698 µS/cm, turb - 34.8 Ftu

1600 Check RU12 parameters

pH - 6.58, temp - 19.3°C

SC - 702 µS/cm, turb - 34.44

1610 ~~1440~~ SSF Check parameters RU12

pH - 6.69, temp 19.3°C

SC - 702 µS/cm, turb - 35.94

1620 ~~1420~~ SSF Empty Purge Water Container

Volume 4 gal

1700 Check RU12 parameter

pH - 6.58, temp - 19.3°C

SC 710 µS/cm, Turb - 34.24

SSF

10/2/00 137-08 SSF 65

Alcas facility, Olean NY

1710 Stop pumping RU12, ~~F~~

have pumped RU12 4 hrs continously

parameter are w/in 10%.

sample is cloudy, turbidity

~~will not~~ has not dropped

below 20 Ftu

Well is considered developed

purge volume 10 gal, time 4 hrs

Correct depth

DTW	DTB
5.74	12.26

1720 Decon Equipment & clean

RU12 area,

1730 Check depth @ RU9

DTW	DTB
13.59	16.24

SSF

10/2/00 137-08 SSF

Alcas facility, Olean NY

1730 Start pumping RU9

Weather Cond: Overcast slight breeze out of NE, temp 65°F

Calculate Sat. Bore Volume

Sat. Bor Vol = 563 ml

pump rate = 500 ml in 1 min 53 sec = 265 ml/min

∴ 1 sat. bore vol every 2 min 7 sec.

1745 Check RU9 parameters

pH - 6.25 temp - 17.7°C

SC - 252 µS/cm

SSF

Alcas facility, Olean NY

1750 Check RU9 parameters

pH 6.34, temp 17.6°C

SC 251 µS/cm

1800 Check RU9 parameters

pH - 6.28, temp 17.9°C

SC - 255 µS/cm, Turb - 8.72 FTU

colorless

1805 stop pumping RU9

well parameters are within 10%, turbidity is < 20 FTU

DTW - 9.15

well RU9 is developed

clean area, decon equipment

purge volume ≈ 3 gallons

purge time 35 min

1830 leave site

SSF

10/3/00 137-08 SSF

Alcas facility, 111b E. State St., Olean, NY

0700 Arrive @ site. load development equipment.

Weather Cond: temp 68°F
Overcast and slight breeze out of East.

Calibrate equipment
pH std 7.01 read 7.00
std 10.01 read 9.99
SC std 50µS read 52µS
std 1000µS read 994µS

Turbidity - std 10 FTU read 10.1 FTU

0730 ~~Sea~~ Jeff set up RU 10 for development
Jeff set up RU8 ~~for~~ for development

SSF

10/3/00 137-08 SSF 69

Alcas facility, Olean NY

Present on site
Jeff Byrd } ENV.
Shawn Flanigan

0800 Start with depth measure of RU10

DTW	DTB
9.65	16.37

0805 start pumping RU10

0810 Calculate Sat. Bore Vol.
Sat. Bore Vol. 1427 ml
pump rate 500 ml in 3 min 50 sec
= 130 ml/min
∴ 1 Sat Bore Vol every 11 minutes

SSF

10/3/00 137-08 SSF

Alcas facility, Olean NY

0825 Check RU10 parameters
pH - 7.10, temp 16.9°C
SC - 1720 µS/cm

0840 Check RU10 parameters
pH - 7.30, temp 17.1°C
SC - 1786 µS/cm

0855 Check RU10 parameters
pH - 7.13 temp, - 17.2°C
SC - 1758 µS/cm
Turbidity - 26.54

0900 Weather Cond. - partly cloudy
temp 72°F, breeze out
of NW

SSF

10/3/00 137-08 SSF 71

Alcas facility, Olean NY

0920 Check RU10 parameters
pH - 7.28, temp 17.3°C
SC - 1760 µS/cm
turbidity - 16.66 FTU
Colorless
Well RU10 parameters are within
10% and turbidity < 20 FTU.
purge volume ~~≈ 3 gal~~ ≈ 2½ gal
purge time 1 hr 15 min
Well RU10 is developed
DTW - 12.42

1000 Move to RU11, set up
Equipment, decon. and clean.

1010 Take water level measurement RU11

DTW	DTB
8.88	18.35

SSF

10/3/00 137-08 SSF

Alcas Facility, Olean NY

1015 start pumping RU11

1020 Calculate Saturated Bore Volume

Sat. Bore Vol. - 2,011 ml

pump rate - 500 ml in 1 min 28 sec

=341 ml/min

∴ 5 min 53 sec for sat bore volume

1100 Check RU11 parameters

pH- 7.10, temp 16.0°C

SC-1575 µS/cm

1115 Check RU11 parameters

pH- 7.20, temp 15.7°C

SC-1558

SSF

Alcas facility, Olean NY

1125 Check parameters RU11

pH - 7.27, temp 16.2°C

SC - 595 µS/cm

1135 Check parameters of RU11

pH - 7.18, temp 15.9°C

SC - 1553 µS/cm

1145 Check RU11 parameters

pH - 7.32, temp 16.1°C

SC - 1560 µS/cm

1150 Empty Purge Container

purge Volume - 5 gallons

1200 Check RU11 parameters

pH - 7.17, temp - 16.0°C

SC - 1549 µS/cm

SSF

10/3/00 137-08 SSF

Alcas facility, Olean NY

RU11 - turbidity - 16.09 Ftu
colorless water
RU11 parameters are within 10%
turbidity is < 20 Ftu, well
development is complete.
purge volume - 8 gal
purge time - 1hr 45 min
DTW - 10.02

1215 Clean and Decon Equipment
clean RU-11. Move to
RU8 and set equipment
up for development

1230 Break for Lunch

1340 Return for Lunch

1350 Set up RU-8 for development
DTW - 10.12 DTB 23.3

SSF

10/3/00 137-08 SSF2

Alcas facility, Olean NY

1400 Start pumping RU-8

~~mea~~

calculate Sat. Bore Volume
Sat Bor Vol = 27.98 ml
pump rate = 500 ml in
3 min 49 sec
= 131 ml/min
∴ 1 sat. bore vol every
21 min.

1500 Check RU8 parameters
pH - 7.43, temp 15.8°C
SC - 705 µS/cm

1525 Check RU8 parameters
pH - 7.50, temp 15.6°C
SC - 696 µS/cm

SSF

10/3/00 137-08 SSF

Alcas facility, Olean NY

1550 Check RU 8 parameters
pH - 7.40, temp - 15.7°C
SC - 696 µS/cm
Turbidity - 18.85 FTU

All well parameters are W/in
10%, Turbidity is < 20 FTU.
well is developed
purge Volume - 4 gallons
purge time - 2 hrs

1600 Stop pump @ RU 8
DTW - 14.62

1605 Decon equipment, clean area
around RU-8

SSF

10/3/00 137-08 SSF 77

Alcas facility, Olean NY

1610 setup on RU-5 for
development

1620 Water measurment RU-5

DTW	DTB
12.31	22.96

1630 Start to pump RU 5
Calculate Sat. Bore Vol.
Sat Bore Vol. - 2261 ml
pump rate - 500 ml in
42 sec
= 714 ml/min
∴ 1 Sat. Bore Vol.
every 3 minute 10sec

1650 Empty Purge Container, Vol - 5gal

SSF

10/3/00 137-08 SSF

Alcas facility, Olean NY

1700 Check RU5 parameters
pH - 7.27, temp 20.2°C
SC - 1923 µS/cm

1705 Check RU5 parameters
pH - 7.32, temp 20.1°C
SC - 1906 µS/cm

1710 Check RU5 parameter
pH - 7.19, temp 20.1°C
SC - 1912 µS/cm
Turb - 349 Ftu

1720 Slow flowrate, parameters stable, waiting on Turb. Empty Purge Container (slow to minimize waste)

SSF

10/3/00 137-08 SSF 79

Alcas facility, Olean NY

1740 Check RU-5 parameters
pH - 7.31, temp 20.2°C
SC - 1891 µS/cm
Turb. - 81 Ftu

1820 Check RU5 parameters
pH - 7.26, temp 20.3°C
SC - 1905 µS/cm
Turb - 14.39 Ftu
colorless

Well parameters are within 10% & Turbidity is <20 Ftu
well is developed
purge volume - 18 gal
purge time - 1 hr 50 min
DTW - 12.22

SSF

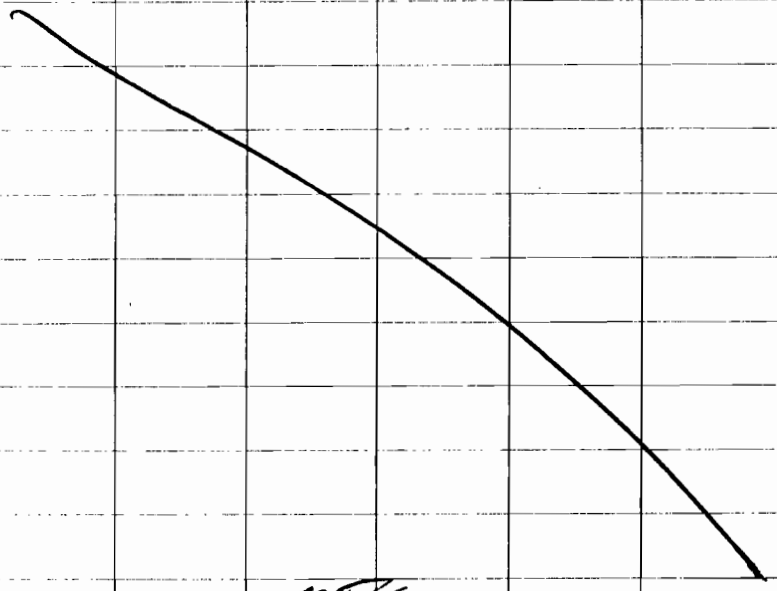
10/3/00 137-08 SSF

Alcus facility, Olean NY

18:40 start decon all equipment and clean area.

1900 assist Jeff with sample collection

2000 Leave Site



SSF

10/4/00 137-08 81

Alcus facility, 1116 E. State St. Olean NY

0700 go get bolt cutters, no keys for existing wells. Confered w/Mr. Prezbindowski it is o.k., Weather - currently not raining, Scattered Thudstm, 62°F

0800 Locate SW14 - open for acclamation, no cap - No bailer PID - 0ppm

0808 Unlock and uncap CW-15A bailer present No sealed cap, PID - 0ppm

0810 Unlock CW-15, no bailer no sealed cap, PID - 0ppm (from slip cap)

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

0815 Unlock B-1 and B-2

(2") B-1 - PID - 0ppm, screw on cap, NOT completely tight (1/2 thread), no bailer

(2") B-2 - PID - 0ppm, screw on cap, Not completely tight (3/4 thread), NO bailer

measure depth to water

B-1 DTW - 10.17' (2")

decon instrument

B-2 DTW - 27.26' (2")

0845 2" { Verm 2 - PID 37 ppm
verm 3 - PID 2 ppm
verm 4 - PID 0 ppm

SSF

10/4/00 137-08 SSF 83

Alcas facility, Olean NY

(2") Verm-1 PID - 26 ppm

(5") RU-4 PID - 592 ppm

All have gasket caps

Verm series has no locks, RU-4 recently installed and has lock

No bailers on Verm series

Weather Cond: Scatter Thunderstorm temp 64°F, Overcast currently raining

0900 Spoke w/ Mr. Prezbindowski (Alcoa), advise check w/ Mr. Litteer (Alcas) for draining standing water @ RW-1.

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

0905 Uncap RU-5, has bailer
~~west~~ PID - 2 ppm, gasket cap
DTW - 12.47' (0.5")

0910 Uncap RU-6 (.5"), PID - 0 ppm
DTW - 14.36',

0915 Uncap RU-7 (.5"), PID - 0 ppm
DTW - 25.28', gasket
cap

0920 Uncap P2 no seal cap,
has bailer, PID - 0 ppm
DTW - 24.86', (2" well)

0925 Uncap P2 (1" well), screw cap
no gasket, PID - 0 ppm
no bailer, DTW - 6.06

SSF

10/4/00 137-08 SSF SS

Alcas facility, Olean NY
no lock (P2)

0930 Weather: rain let up
significantly. Overcast
temp 63°F

0940 Locate CW-12B, 3 locations
in area map indicate south
to be 12B. All 3 locations
have been asphalted.

0945 return to CW 15 & CW 15A
to take depth
CW 15A (2") - DTW 12.92

0950 CW 15 (2") DTW - 17.04

0955 return to SW-14 (2")
DTW - 17.47

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

1000 Read RU-12, PID-0ppm (0.5" well) DTW - 5.28 has bailer and gasket cap.

1005 read RU-9, PID-0ppm (0.5" well), DTW - 9.25 has bailer and gasket cap.

1010 read RU-10, PID-0ppm (0.5" well), DTW - 9.79 has bailer and gasket cap

1014 read RU-11 (0.5" well) PID - 0ppm, DTW - 8.01 has bailer and gasket cap

SSF

10/4/00 137-08 SSF 87

Alcas facility, Olean NY

1020 staff gauge readings 0.11 Ft.

1025 Measure North CW-13 well (2") no bailer, non gasket cap, DTW - 9.95 * southern well is labeled CW-13, map indicates should be 13A. Will refer as labeled (North 13A)

1030 Measure South CW-13 (labeled CW-13) PID - 0ppm DTW - 18.59, (2" well) has bailer and non-gasket cap.

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

1040 Spoke w/Tim White (ENV.)
Dont worry about CW-12B,
since asphalted over.

1050 Measure RU-3 (0.5" well)
(PID 0ppm) DTW - 27.37 DTB - 27.57
X Corrected measurment for
out side casing.
Well was purged 10/3/00
purge volume was 120 gl
@ 1730
sample for pH, temp, SC

1100 Sample RU3 - 3 VOA
Calibrate instruments
pH - std 7.01 read 7.03
Std 10.01 read 10.13
SC - std 50 µs read 56 (15.7°C).
Std 1000 µs read 998
SSF

10/4/00 137-08 SSF 89

Alcas facility, Olean, NY

RU 3 readings pH - 7.18
temp 18.9°C, SC - 928 µS/cm

~~1100~~ 1115 Jeff converse w/ Tim White
@ ENV.

1130 Locate CW-10B, open,
(2" well) 3 wells in area
CW-10 & CW-10A labeled
assume third is CW-10B.
No bailer, non gasket cap
PID - 0 ppm

1140 DTW - 6.74

1200 Read RU-1 PID - 0ppm
DTW - 15.80
Calc. purge Volume

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

purge Vol = $\pi\left(\frac{D^2}{4}\right)(DTB - DTW)$

= 558 ml for RU1

3 Volumes x 2 liters

1230 Sample RU-1 clear

pH - 7.63 S.C. 886 µ

T - 11.3 °C

1315 Break Lunch

1400 return to site, setup

for RU-7 sampling

~~purge~~ well Volume - 85 ml

purge Volume - 250 ml

1440 Finish purge 300 ml

pH - 7.42, temp 13.0°c

SC - 574 µS/cm

SSF

Alcas facility, Olean NY

1445 start sampling RU-7

1530 Finish sampling RU-7

Clean area, ? decon equipment

1545 RW-1 ~~was covered~~ non hole cover ~~submerged~~ submerged in water - removed water & open cover - 4" well - no water in hole & looked dry, PID - 11 ppm

1555 Read Vern-2, PID - ~~0 ppm~~ SSF ppm (2" well) w/ gasket cap

DTW - 8.90

1600 read depth Vern-1

DTW - 10.23

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

1605 read depth @ Verm-4
DTW - 9.11

1608 - read depth @ Verm-3
DTW - 8.56

1613 - read depth @ RW-1
DTW - 11.35
PID was 11ppm when cap was removed

1620 Start to set up for sampling RW-6.
Calc. purge volume
well vol - 330 ml
purge vol - 990 ml
≈ 1 l

SSF

10/4/00 137-08 SSF 93

Alcas facility, Olean NY

1645 Soil Comp. collected

1650 RW-6 purge is complete
purge vol ≈ 1.5 liters
pH - 7.09, temp - 17.5°C, SC - 864 µS

1700 Start sampling RW-6

1715 Sampling RW-6 complete

1720 Decon and clean equipment
Clean and recap RW-6
move to RW-4 and prepare to sample

1730 setup on RW-4
DTW - 12.71
Vol (water) 226 mL
Purge vol 700 mL

SSF

10/4/00 137-08 SSF

Alcas facility, Olean NY

1730 S. Flannigan working on RU-2

1745 collect purge water sample

1750 collect Decon water sample
Both above samples are composites

1755 measure RU-8
DTW - 14.67 PID - 0.ppm

1830 leave site for supplies

1915 return to continue work on RU-2

2200 leave site

SSF

10/4/00 137-08 Byrd SSF95

Alcas facility, Olean NY

1830 collect sample RU-4 clear
pH 9.39
S.C. 1244
Temp 19.1

2200 end of day

Byrd SSP

10/5/00 137-08 Byrd SSF

Alcas facility, Olean NY

0730 Weather Cond - 46°F, Overcast, slight drizzle.

present @ site - Jeff Byrd & Shawn Flanigan (ENVIROFERN)

0800 start work on RU-2 and cleaning site.

1330 remove bailer & begin to ~~go~~ purge RU-2
well volume 50 ml
purge vol. - 150 ml

1350 purge complete - 200 ml

1400 Sample RU-2

SSF

10/5/00 137-08 SSF-97

Alcas facility, Olean NY

1415 clean RU-2 decon equipment.

1430 label all drums
3 - soil, 1 - purge
3 - decon
as HAZ.

1445 clean sled (storage) & pack gear

1500 leave site

SSF

9/26/00 137-08 [signature]

Cotco Cottery Corp (Alcas)

1116 S. State St.

0700 Arrive @ site

0750 Set up on RU-4 7-3' of grout

0810 Begin cutting hole in @ bottom concrete re-open Hole to grout

Weather: Overcast ~44°F

0830 PID: 0 PPM

Hole through 6" concrete

Background PID: 0 PPM

		PID
0835	1424.88	
0-6.5	concrete	
0.5-2.5 ~~6.5~~	firm gray clay w/ small rock light iron staining ~~iron~~	37
2.5-3	SAA w/ course rock	92
	RU4-SL 0102 @ 0850	
3-4.5	SAA rock decreasing size mostly red color	69

[signature]

9/26/00 137-08 [signature] 2

Alcas (Cotco)

		PID
4.5-6	firm gray clay w/ root trace & magnesium & iron nodoles small gravel	16
	RU4-SL-0506 0900	
	Breathing Air 0 PPM 0906	
	hole - 83 PPM 0906	
6-8	no rec	
8-12	Firm gray clay w/ large & small gravel fossilized material	7
0920	Breathing zone (BZ) - 0 PPM	
	hole - 17 PPM	
	unable to unscrew sample barrel tip must remove to inspect	

[signature]

137-08 09/26/00 Byrd

Alcas

1116 S. State Ste

RU-4 cond

12-13 SAA

13-13.5 gray shale layer very layered

13.5-16 tan clay silt saturated w/ small gravel

RU4-SL-1415 1010

16-18 firm gray clay w/ large rock

18-19 soft olive gray silty clay w/ small rock (clay & silt) softer toward 19

19-20 no recovery

RU4-SL-1617 1040

RU4-SL-1819 1041

Byrd

16

37

234

137-08 09/26/00 Byrd 4

Alcas

1050 Breathing zone (BZ) - 0 PPM

hole - 631 PPM

RU-4 cond PID

20-23 SAA w/ thin layer of ~~brown~~ gray dark gray gravel 16

Photo taken

23-24 no rec.

1109 BZ 68 PPM

Hole 0 PPM

24-28 no rec. sample lost in hole appeared to SAA

28-29.5 large & small gravel sand & silt very unconsolodated (Photo) 16

29.5-32 no rec.

RU4-SL-2829 1130

Byrd

137-08 09/26/00 Byrd

Atlas

1200 Call ENI - speak w/ B. Stevens & T White decide to grout hole back to 20' measure hole - it has collapsed to ~25' place grout on top of this 20'-25'

1230 break for lunch & get supplies

0330 return to site. Weather: 58°F Partly cloudy Begin decon & completion of RU-4

~~15~~

1545 Set up on RU-7 weather: Sunny 75°F

Byrd

137-08 09/26/00 Byrd 6

Atlas - Cutco

RU-7 1429.1 PID

1546 BZ - 0.0 PPM

0-4 olive tan silty clay w/grass @ surface & roots: small & large gravel (Photo) 0

4.5 SAA w/ increasing moisture & few organic nodules (Photo) RU-7-SL-0102P 0000 0

8-9 SAA 0

9-11 fine clay silty moist w/ rocks small & large 0

11-12 ~~SAA~~ no rec

12-13 SAA 1615 RU7-SL-0910

13-16 Olive gray silty clay w/ brown shale/rock 0

1630 RU7-SL-1314

Byrd

138-07 9/26/00 Byrd

Atlas

RV-7 Cond PID

16-17 brown shal w/ sandy silt 1645 RV7-SL-1718 0

17-20 olive gray silty clay w/ gravel 0

1650 BZ - 0.0 PPM

Hole - 4 PPM

20-24 SAA w/ silt layer @ 21.5' saturated 0

1720 Weather: 60°F clear

Light breeze from west

BZ - 0 PPM

Hole - 10 PPM

24-26 SAA 1720 RV7-SL-2425 0

26-27 firm tan silty clay w/ few rocks 0

1730 set well @ 28

Byrd

138-07 9/26/00 Byrd 8

27-28 no rec.

1830 completed well RV-7

screen 28-19'

riser 19-0

sand 28-17

seal 17-15

Mr. Pierzbindowski requested that grouting not be completed until pump is delivered

1845 Leave site drillers still cleaning up

Byrd

5200

137-08 9/27/00 Byrd

Alcas

0700 arrive @ site drillers down & begin coring hole for RU-6

Weather: 40°F overcast & foggy

0800 begin drilling

0-0.5 concrete

0.5-2 large gravel, sand & little silt

0810 RU6-SL-0102

2-4 no rec

4-4.5 SAA

4.5-8 soft tan silty clay/clay silt w/ few large rocks

0820 RU6-SL-0506

Byrd

137-08 9/27/00 Byrd 10

Alcas

RU-6 cont PID

0825 Breathing Zone (BZ) 0 PPM

Hole 0

8-9 SAA w/ large gravel 0

9-10 SAA more clay 0

PID 10-10.5 gray shale layer

10.5-12 gray clay w/ few small gravel & magnesium nodules 0

12-16 olive gray clay w/ little silt few large gravel & small gravel more silt toward 16' 0

0845 RU6-SL-1213 0840 RU6-SL-1112

0850 BZ 0

Hole 0

16-18.5 SAA 0.1

18.5-19 shale layer

19-20 & no rec.

Byrd

137-08 9/27/00 TByrd

Alcas

RV-6 core

0905 BZ

Hole

20-21 soft clay silt w/ little sand saturated

0915 RV6-SL-2021

21-23 firm clay w/ gravel

23-24 no rec 0917 RV6-SL-2122

0920 Well completion

screen 24-15'

riser 15-0'

sand 24-13'

seal 13-11

grout 11-0

Weather mostly sunny ~45°F

TByrd

PID

0

0

0

77

137-08 9/27/00 TByrd 12

Alcas Facility (Cutler)

RV-3

1000 begin decon

Weather: clear 60°F

Breeze from NW

1045 set up on RV-3 1428.72 PID

BZ 0

0-3 firm brown clay w/ roots & small gravel burnt material & tar or asphalt pieces pieces of red conglomerate 0

1100 RV3-SL-~~0102~~ 0203 ft

3-4 no rec

5-6 SAA 1110 RV3-SL-0506

6-7 dark gray silty clay soft w/ few calcite nodules few roots & burnt wood chips 0

TByrd

09/27/00 137-08 [signature]

Alcas Facility

RU-3 Cont'd

7-8 no rec

8-10.5 SAA lighter color — 0

some large gravel

light tan silt layer

at ~8.5'

10.50 no rec

1119 RU3-SL-0809

12-12.5 dark brown silty clay — 0

large gravel organic in nature

12.5-16 olive gray clay w/ gravel — 0

shale rock @ 15.5'

1135 RU3-SL-1314

1140 BZ — 0

Hole — 0

[signature]

09/27/00 137-08 [signature]

Alcas Facility

RU-3 cont'd — PID

16-18.5 loose gravel small & — 0

large w/ poor mica & sandstone

18.5-20 no rec.

20-23 SAA — 0

23-24 no rec

1205 BZ ~~1200~~ — 0

Hole RU3-SL-~~1920~~ — 0

actually 18-18.5'

Weather 72°F light

N Breeze sunny

Note @ 1500 PB

well completion

screen 28-19

riser 19-0

sand 28-17

seal 17-15

grout 15-0

24-25.5 tan silt clay w/ layers — 0

of silt saturated

1228 RU3-SL-2425

25.5-28 gray clay w/ gravel

few iron nodules

28-30 - did not recover most

1240 RU reached City Aquifer

RU3-SL-2627

[signature]

9/27/00 137-08 ~~Byrd~~

Alcas facility

1255 break for lunch

1400 return to site

Drillers have starting to set RD-3

Weather: 92°F Light breeze sunny

Picked up gloves from Room

1430 begin decon ing.

1450 equipment & supplies arrive

1520 setup on ENI-1 1425.9

0-1.5 Dark clay w/ gravel & grass & roots

1.5-4 ton silty ~~sand~~ clay w/ little sand, roots & gravel

1530 ENI-SL-010

~~Byrd~~

9/27/00 137-08 ~~Byrd~~ ~~14~~ 16

Alcas facility PID

4-7 SAA ~~clayish~~ more clay @ 7' 0

7-8 no rec

8-11 ~~SA~~ olive gray clay ~~ENI-SL~~ w/ gravel & rocks little silt 0

1545 ENI-SL-~~0910~~ 0809 13

11-12 no rec

12-16 SAA 0

1600 Weather: 75°F Light wind from West

16-20 SAA w/ increasing silt 0

1609 ENI-SL-1420

20-21 no rec

21-23 SAA w/ shale layer at 23 0

23-23.5 ton silty clay w/ gravel moist 0

~~Byrd~~

137-08 9/27/00 Byrd

Alcoa Facility

1625	ENI-1 cond	PID
	BZ	0
	Hole	0
24-25	coarse sand w/ silt & large gravel	0
25-25.8	tan clay layer w/ gravel sand & silt saturated	
	ENI-SL-2425	
25.8-26.5	coarse silty sand w/ large gravel & rock	0
	ENI-SL-2526	
26.5-28	no rec	1700 ENI-SL-3031
28-31.5	SAA w/ sandy layer @ 31.5'	0
31.5-32	no rec.	
32-36	SAA w/ coarse sand & gravel @ 36'	0

Byrd

137-08 9/27/00 Byrd 2 of 2

Alcoa Facility

	ENI-1 cond	PID
1726	BZ	0
	Hole	0
36-40	recc large rock in sample tube	
	Grout hole as per agreement w/ Mr Pierchalowski of Alcoa	
1800	Drillers begin to clean area	
1815	Leave site	

Byrd

137-08 9/28/00 TByrd

Alcas facility

0615 Calibrate PID on Isobutylene - 99 ppm

0705 arrive @ site Drillers begin to decon equipment & finish grouting of well

Prepare equipment for sampling.

S. Flannigan present

Weather: 48°F overcast slight breeze from N.SW.

0845 Drillers have grouted wells: RV-4; RV-7; RV-6; RV-3; stopped ENI-1

0910 Set up on RV-1

Weather: 42°F overcast slight breeze from West

TByrd

137-08 09/28/00 TByrd 0820

Alcas Facility

RV-1 PID

BZ 0

Hole 0

0-0.5 asphault

0.5-1.5 gravel ton 0

1.5-2.5 firm gray clay 0

2.5-4 no rec

0920 RV1-SL-0107

4-5.5 SAA + iron staining silty (light) 0

5.5-6 rock, ton

6-8 firm red clay few small gravel 0

0928 RV1-SL-0405

8.5-8 sandy silt clay gray w/ gravel 0

8-11 SAA w/ increasing sand

TByrd

137-08 9/28/00 Byd

Alcas Facility

RU-1 cond PID

11-12 no rec

0935 RU1-SL-0910

12-16 Firm olive gray clay 0
w/ silt, gravel & rock
few iron nodules
More ton toward 16'

0944 RU1-SL-1213

16-19 SAA 0

19-20 no recovery

1000 BZ 0
Hole 0

20-24 gray clay w/ silt gravel C
smooth & rough gravel

1010 RU1-SL-2122

24-25 SAA ~~w/ silt~~ very silty
saturated

Byd

137-08 9/28/00 Byd ~~2021~~

Alcas Facility

RU-1 con PID

25-28 ~~very~~ firm clay w/ gravel 0

1040 RU1-SL-2526 saturated

28-32 SAA firm w/ declining
gravel size toward 32'

1105 RU1-SL-3132

begin to set well
screen 32-23'
riser 23+0'
sand 32+21
seal 21-19'
grout 19-0

Weather: 50°F mostly cloudy

~~1120~~ 1115 Mr Bob Ackerman of
Robert C Ackerman Surveying
arrives I show him the
locations of wells &
borings Byd

137-08 9/28/00 Byrd

Alcas Facility

1130 Mr Liteer & I look over location for RV-2 He approves a locations

1200 Mr Ackerman leaves after obtaining a copy of the site map Drillers having difficulty with well - last drive point & start over

1230 Point won't dislodge Driller calls Buffalo office (R. Crouch) & they call Geoprobe

1238 R. Crouch returns call - has no useful suggestions

1320 Well dislodged - total depth 31' - appears no damage occured to screens

Byrd

137-08 9/28/00 Byrd

Alcas Facility

1350 Drillers break for lunch

1400 Break for Lunch

1430 return - drillers decontaminating

450 Go speak w/ Mr Bailey about beginning to drill on his property tomorrow - he was fine with that

1500 drillers set up on RV-1 Push ~2' & Rig breaks begin to repair

1610 Drillers ready to continue

Byrd

137-08 09/28/00 JSyd

Alcas Facility

RU-2 1427.5

		PID
0-0.5	Dark silty clay (organic) grass @ surface w/ little gravel	0
0.5-1.5	Tan sandy clay w/ large gravel	0
1.5-2	Dark stained as above w/ iron nodules & hair	0
1620	RU2-SL-0102	
2-4	no rec	
4-6	Tan silty clay w/ gravel & rock	0
1625	RU2-SL-0506	
6-8	no rec.	0
8-11	SAA silty between 9 & 10'	0
1630	RU2-SL-0910	
11-12	no rec	

JSyd

137-08 09/28/00 JSyd 24

Alcas Facility

RU-2 cont'd PID

Weather: Breeze from ~~N NW~~ NNW

70° mostly sunny

	BZ	0
	Hole	0
12-16	Firm olive gray/tan clay w/ rock & gravel little silt	0
1640	RU2-SL-1314	
16-20	SAA	0
20-24	SAA - thin silt layers	0
24-26	SAA	0
1740	RU2-SL-2526	
26-26.5	coarse gravel w/ sand & silt, tan	0
26.5-28	no rec	
~~28-29~~ 30	~~coarse gravel in clay, gray~~	

JSyd

137-08 09/28/00 BJM

A/cas Facility

1750 Weather: sunny 60°F very slight breeze from N

RV-2 cont'd

		PID
28-~~33~~ 29	coarse gravel very silt	0
29-32	no rec.	
32-33	coarse gravel brown	0

1815 RV2-SL-3233

1820 Decision made to grout hole up & push new hole nearby for well.

1850 Drillers leave site after

1900 preparing pumps for freeze

~~1900~~ leave site

BJM

137-08 9/29/00 BJM

A/cas Facility

0700 arrive @ site Drillers present begin preparing for completion of RV-2 weather 31°F overcast & foggy

Calibrate PID 100.2 ppm for 100 ppm span gas

0730 Drillers set up on RV-2 well location & begin driving barrel

Also grout RV-2 boring location

0740 Have ~~been~~ hit refusal @ 25' after hammering for @ least 15 minutes

Decision made to move to new location & use same barrel

BJM

137-08 9/29/00 Byrd

~~Alcoa~~ Alcas

0900 Drillers set up on new location

0940 reach target depth of 29' Driller reports that Boring took 8 gal. grout & will need to be topped

1000 Reach 29' @ RU-2 & set well

- screen 29 - 20
- riser 20 - 0
- sand 29 - 17
- seal 17 - 15
- ~~seal~~ grout 15 - 0 (to be completed later)

1025 begin decon

1100 arrive @ Mr Baileys setup on RU-12 Mr Bailey Present

Byrd

137-08 9/29/00 Byrd 28

Alcas Facility

RU-12 1419.28

		PID
0-2	soft silty clay w/ roots & small gravel grass @ surface	0
2-3	top soil silty clay w/ iron staining & coal traces	
3-3.5	gray silty sand	0
3.5-4	no rec.	
1125	RU12 - SL-0203	
4-7	SAA w/ increasing silt gray w/ shale @ 7' very moist	0
1135	RU12 - SL-0506	
1137	BZ	0
	Hole	0
7-7.5	SAA - shale & silt gray	
7.5-8	no rec.	

Byrd

137-08 9/29/00 JByrd

Alcas Facility

RV-12 cont'd PID

8-12 firm olive tan clay w/ 0
silt & gravel

1142 RV12-SL-0910

12-15 SAA w/ increasing gravel 0
size

1150 weather: 58°F sunny
light breeze from S.

20-23 SAA 0

23-24 no rec.

24-25 SAA 0

25-26 coarse sand & gravel brown 0
& tan

26-28 no rec. grout to 15' Bgs

1245 Break for lunch

1340 return to site

JByrd

137-08 9/29/00 JByrd 30

Alcas Facility

RV-12 Cont'd 1

Well boring collapsed
to 7' Push down to
13' & set well
screen 13-4
riser 4-0
sand 13-2
seal 0-2-1

1415 well completed except
grouting Drillers go
to decon

1420.72 PID

setup on RV-9

1520 brown silty clay w/roots 0

0-4 & organic nodules grass
@ surface gray fine between
3 to 4'

1530 RV9-SL-0203

JByrd

137-08 9/29/00 Byrd

Alcas Facility

Mr Bailey's Property

RV-9 con'd

4-4.2	SAA	0
4.2-6	tan/red sand little silt 6607p	0
1540	RV9-SL-0506	
6-6.5	moist silty sand tan w/ iron nodules	
6.5-7.5	coarse tan silty sand w/ gravel	
7.5-8	no rec.	
8-10.5	SAA saturated	0
10.5-12	no rec.	
12-13.5	SAA w/ coarse gravel saturated & clay	
13.5-15	brown silty clay layered 1550 RV9-SL-1213	0

Byrd

137-08 9/29/00 Byrd 32

Alcas Facility

Mr Bailey's Property

RV-9 con'd PID

15

15-17	SAA	0
1610	RV9-SL-1516	
1600	Set well	

screen 17-8

riser 8-0

sand 17-6

seal 6-4

grout 4-0

1630	well completed
1640	Evingham, check from Buffalo drilling replaced Don Morris @ ~1500
1650	Drillers leave
1710	leave site

Byrd

137-08 9/30/00 Byrd

Alcas Facility 1116 E. state St.

0700 arrive @ site

0715 Drillers arrive wait for gates to be opened

0720 Drillers begin decon

weather: clear light breeze from east 39°F

Calibrate PID - 99.8 ppm w/ 100 ppm span gas

0760 Drillers begin to grout wells RU-1 2.5 Gal

RU-2 5 (Hole 10)

RU-12 0.5

RU-9 2

0845 setup on RU-10

weather: sunny SE breeze ~45°F

Byrd

1471.07

137-08 9/30/00 Byrd 34

Alcase Facility

Mr Bailey's property

RU-10

		PID
0-4	brown silty clay w/ little sand. roots & grass root traces. Light iron staining	0
0900	RU10-SL-0102	
4-7	SAA w/ gravel & increasin sand	0
7-8	boulder/ton silty sand	0
0906	RU10-SL-0708	
	BZ	0
	Hole	0
8-10.5	SAA saturated	0
10.5-12	no rec.	
12-13.5	SAA	0
13.5-14.5	brown sandy clay w/ decreasing sand w/ depth gravel	0

Byrd

137-08 9/30/00 Byrd

Alcoa Facility, Clean N.Y.

Mr Bailey's Property

RU-10 cont'd PID

16-17 SAA silty little sand & gravel 0

0930 ~~RU-10~~ RU10-SL-1617

set well

screen 17-8

Riser 8-0

sand 17-6

seal 6-4

grout 4-0

1000 Drillers leave to steam clean - Add ~ 1 gal grout to ENI-1

1100 return to Mr. Baileys & setup on RU-11

Byrd

137-08 9/30/00 Byrd 36

Alcoa Facility

Mr Bailey's Property

RU-11 1420.07 PID

0-3 gray silty clay brown toward 3' glass fragments @ 2' burnt wood & roots glass @ surface 0

3-3.5 gray silty clay - soft w/ roots 0

1110 RU11-SL-~~0102~~ 0203 B

3.5-4 no rec

4-8 SAA turn mostly gray rock @ 6.2' & 7.5' gravel throughout w/ little sand

1115 RU11-~~0~~-SL-0405

Byrd

137-08 9/30/00 Byrd

Alcase Facility
Mr Bailey's Property
RU-11 cont'd

		PID
8-10	SAA w/ large gravel & rock Frm @ 9.5-10'	0
10-12	soft tan clay silt saturated w/ little sand	0
12-15	SAA gray 1125 RU11-SL-1012	0
15-15.5	grad gray silty clay w/ gravel & little sand	0
1135	BZ (Breathing Zone) Hole	0
15.5-16	no rec	0
16-19	SAA	0
19-20	no rec.	
1140	RU11-SL-1617	
20-22	SAA	

Byrd

137-08 9/30/00 Byrd

Alcas Facility
Mr Bailey's Property

RU-11 cont'd

		PID
22-23.5	gray clay w/ ~~fine sand~~ little gravel & silt	0
1150	RU11-SL-2223	
23.5-24	no rec	
24-27	SAA	0
27-28	no rec	
28-31.5	SAA	0
31.5-32	no rec	
1230	Break for lunch	
1330	return - drillers have made next push	
32-34	SAA	0
34-36	no rec	
36-39.8	SAA hard shale @ 39.8 feet - refusal	0

Byrd

137-08 9/30/00 Byrd

Alcas Facility
Mr Baileys Property
RV-11 cond

1430 Decide to move forward ~2' and set well in manhole

screen	19-10
riser	10-0
sand	19-8
seal	8-6
grout	6-0

1530 well grouted
Drillers move to decon
1630 begin coring hole near RV-4
1650 begin pushing to 16'
1745 Have hit refusal @ 8'
Drillers prepare to leave
1810 leave site

Byrd

137-08 9/10/00 Byrd 40

Alcas Facility 1116 E. State St
Olean, NY

0700 arrive @ site - gates locked get personnel to open
weather: foggy 42°F light east breeze
0730 Driller arrives & begin to decon
0830 set up on RV-8 PID
0-1 black silty clay oil stained w/ roots & grass 0
1-4 tan silty clay w/ little gravel lighter color near 4' 0
0845 RV8-SL-0203
4-8 SAA moist
8-8.5 SAA organic layer @ 8.5' 6

Byrd

137-08 10/1/00 Byrd

Alcas Facility, Oleon NY

RV-8 cont'd w/ gravel PID

8.5-9.5 ton clay silt, moist 0

9.5-10.5 olive gray silty clay w/ gravel 0

10.5-12 no rec 1423-92

0902 RV8-SL-0910

12-14.5 light gray silty clay w/ gravel 0

0908 RV8-SL-1218

14.5-16 no rec

16-17.5 ton silty gravel saturated 0

17.5-20 firm silty gray clay w/ gravel 0

0920 RV8-SL-1617

0922 RV8-SL-1819

20-22.5 SAA moist 0

22.5-24 no rec.

Byrd

137-08 10/1/00 Byrd

Alcas Facility Oleon NY

RV-8 cont'd

0930 Set well

screen 24-13

riser 13-0

sand 24-11

seal 11-9

grout 9-0

1000 begin well completion

1132 Drillers complete installation of RV-8 & begin on RV-1

1210 Drillers leave for the day

1520 Leave site

Byrd

137-08 10/2/00 Byrd

A/cas Facility, 1116 E. Stoltst.
Olean NY

0700 arrive @ site
Drillers are deconing & begin removing geoprobe unit from truck

0840 Fork lift arrives to aid in removal

0920 begin coreing hole in concrete @ RV-5

0945 through the concrete & working on removing the water

0950 found pipe hidden in location of coring - left to talk to Mr Litteer - He is out for the day - speak w/ Mark Fallend He will bring

Byrd

137-08 10/2/00 Byrd 44

A/cas Facility, Olean NY

the site floor plan - there is nothing on the floor plan indicating any pipes in this area - the type new location

1030 begin coring new location

1100 begin coring RV-5 & Surveyor arrives

RV-5 1424.6 PID

0-3	rd/brown silty clay & clay silts w/ little ~~sand~~ gravel	~0
3-3.5	~~tan~~ brown silty clay w/ gravel (small & large)	0
1110	~~RV8~~ RV5-SL-0203	
3.5-4	no rec.	

Byrd

137-08 10/2/00 TByrd

Alcoa Facility, Orem UT

RU-5 cont'd PID

BZ 0

Hole 0

1120 Break for lunch - onloading liquid ammonia nearby

1215 return to site - Ammonia unloading completed

RU-5 cont'd

4-7 SAA moist w/a rock @ 6' 0

7-8 tan clay silt w/ gravel 0

1240 Drillers arrive

weather: sunny, light east wind 76°F

TByrd

137-08 10/2/00 TByrd 46

Alcoa Facility

RU-5 cont'd PID

8-10.5 gray clay, silty w/ gravel - rock @ 10' 0

1255 RU-5-SX-0807

Check PID w/ span gas = 99.5 ppm

10.5-12 no rec

BZ 0

Hole 0

1310 Have hit refusal - going to strap table to floor

Don Morris is working on surface completion has completed RU-4, 6, 7 & 2

1325 weather wind from S-SW 81°F sunny

1400 began pushing

TByrd

137-08 10/2/00 Byrd

Alcoa Facility; Olean NY

RW-5 cont'd

12-16	SM	
16-17	coarse silty sandy gravel	6
1420	RW5-SL-1617	
17-18	firm gray clay w/gravel & silt	0
1424	RW5-SL-1718	
18-20	no rec.	
	BZ	0
	Hole	0
20-23	SM very silty between 22 & 23'	4
1445	Set well	
	screen 24-15	
	riser 15-0	
	~~seal sand~~ 24-13	
	seal 13-11	
	grout 11-0	

Byrd

137-08 10/2/00 Byrd 48

Alcoa Facility, Olean NY

PID

1500 Call Bob Prerbindowski of Alcoa, TN update him on the site status

1510 Ask Mr Bailey if he is satisfied with the completions

1600 RW-5 complete

1800 all wells completed Drillers leave site

1830 leave site

Byrd

137-08 10/3/00 Byrd

~~Alcoa~~ Alcos facility, Olean NY

116 E State St.

0700 arrive @ site

0730 water level @ RV-8

DTW - 10.12 DTB - 23.3

weather 68°F overcast &

light breeze from the west

0745 begin bailing RV-8

Vol - 2798 ml

1015 strange winds from east

very silty - will wait for

pumps

1230 break for Lunch

1330 return to site

goto receiving - have

not received keys

1350 call Bob Przybindowski

of Alcoa

Byrd

137-08 10/3/00 Byrd 50

Alcas Facility

Mr. Bailey's Property

He said that he did not

have the keys sent & that

we should cut the keys

& relock them w/ new

We are to send the new

keys to Mr Przybindowski

1415 Sample RV-12 cloudy rusty

1440 Sample RV-9 silt

1500 Sample RV-10 silty

1530 Sample RV-11 silty

1645 Sample RV-8

1708 Gauge RV-3

DTW - 22.05' DTB - 27.6

Vol = 210 ml

1730 Less than 0.5' water in bailer

error in DTW measurement

~120 ml purged Byrd

137-08 10-3-00 Byrd

Alcas Faculty

	DTW	DTB
	10.12	23.3

1755 Measure depth to water in RU-2
DTW - 27.30 DTB - 28.6
Vol - 50mL
Breat time: 1930
1730 Sample RU-5
1935 rope breaks in RU-2 have one VOA collected
2000 leave site

Byrd

10-4-00 137-08 Byrd

Alcas Facility 1116 E. State St
Olean, NY
0700 arrive @ site Calibrate PID - 99.8 on 100 ppm Spangas
Note: record of activities in Field book 101
2200 leave site

Byrd

10-5-00 137-08 Byrd

Alcas Facility, 1116 E State St
Olean New York

0800 arrive @ site
begin working on RV-2
Label all Drums as Haz
- 3 soil
- 1 Purge
- 3 Decon

1500 leave site

Byrd

ENVIRONEERING, INC.

APPENDIX D

LABORATORY SUMMARY REPORT
AND
DATA VALIDATION REPORT

SEVERN TRENT SERVICES
STL Savannah
5102 LaRoche Avenue • Savannah, GA 31404 • Tel: 912 354 7858 • Fax: 912 352 0165 • www.stl-inc.com

LOG NO: S0-06908
Received: 06 OCT 00
Reported: 26 OCT 00

Mr. Andrew Harper
Environeering, Inc.
16350 Park Ten Place Ste 140
Houston, TX 77084

Project: ALCAS/137-08
Sampled By: Client
Code: 180701025

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
06908-1	RU1-GW-2780	10-04-00/12:30	ALCA10
06908-2	RU2-GW-2790	10-05-00/14:00	ALCA10
06908-2-DL	RU2-GW-2790	10-05-00/14:00	ALCA10
06908-3	RU3-GW-2780	10-04-00/11:00	ALCA10
06908-3-DL	RU3-GW-2780	10-04-00/11:00	ALCA10

PARAMETER	06908-1	06908-2	06908-2-DL	06908-3	06908-3-DL
Volatiles (CLP-10/92)					
Tetrachloroethene, ug/l	1U	1U	2U	0.4J	2U
Trichloroethene, ug/l	67	270E	300D	210E	240D
cis-1,2-Dichloroethene, ug/l	1	3	5D	39	47D
trans-1,2-Dichloroethene, ug/l	1U	1U	2U	0.8J	1DJ
Vinyl chloride, ug/l	1U	0.4J	2D	38	32D
Dilution Factor	1	1	2	1	2
Analysis Date	10.16.00	10.15.00	10.16.00	10.15.00	10.16.00
Batch ID	2B1016	1B1015	2B1016	1B1015	2B1016

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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
06908-4	RU4-GW-2780	10-04-00/18:30	ALCA10
06908-4-DL	RU4-GW-2780	10-04-00/18:30	ALCA10
06908-5	RU5-GW-2770	10-03-00/17:30	ALCA10
06908-5-DL	RU5-GW-2770	10-03-00/17:30	ALCA10
06908-6	RU6-GW-2780	10-04-00/17:15	ALCA10

PARAMETER	06908-4	06908-4-DL	06908-5	06908-5-DL	06908-6
Volatiles (CLP-10/92)					
Tetrachloroethene, ug/l	500U	2500U	19J	500U	52
Trichloroethene, ug/l	190000E	130000D	56000E	54000D	58000E
cis-1,2-Dichloroethene, ug/l	4600	4300D	170	260DJ	420
trans-1,2-Dichloroethene, ug/l	110J	2500U	50U	500U	12J
Vinyl chloride, ug/l	1100	2500U	33J	500U	14J
Dilution Factor	500	2500	50	500	50
Analysis Date	10.15.00	10.16.00	10.15.00	10.16.00	10.15.00
Batch ID	1B1015	2B1016	1B1015	2B1016	1B1015

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Code: 180701025

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
06908-6-DL	RU6-GW-2780	10-04-00/17:15	ALCA10
06908-7	RU7-GW-2780	10-04-00/14:45	ALCA10
06908-8	RU8-GW-2770	10-03-00/16:45	ALCA10
06908-8-DL	RU8-GW-2770	10-03-00/16:45	ALCA10
06908-9	RU9-GW-2770	10-03-00/14:40	ALCA10

PARAMETER	06908-6-DL	06908-7	06908-8	06908-8-DL	06908-9
Volatiles (CLP-10/92)					
Tetrachloroethene, ug/l	500U	1U	2U	4U	1U
Trichloroethene, ug/l	67000D	3	480E	360D	4
cis-1,2-Dichloroethene, ug/l	570D	1U	39	30D	1U
trans-1,2-Dichloroethene, ug/l	500U	1U	2U	4U	1U
Vinyl chloride, ug/l	500U	1U	10	7D	1U
Dilution Factor	500	1	2	4	1
Analysis Date	10.16.00	10.15.00	10.16.00	10.16.00	10.15.00
Batch ID	2B1016	1B1015	2B1016	2B1016	1B1015

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Sampled By: Client
Code: 180701025

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
06908-10	RU10-GW-2770	10-03-00/15:00	ALCA10
06908-11	RU11-GW-2770	10-03-00/15:30	ALCA10
06908-12	RU12-GW-2770	10-03-00/14:15	ALCA10
06908-13	RU4-GW-2780D	10-04-00/18:30	ALCA10
06908-16	Trip Blank	10-05-00	ALCA10

PARAMETER	06908-10	06908-11	06908-12	06908-13	06908-16
Volatiles (CLP-10/92)					
Tetrachloroethene, ug/l	20U	1U	1U	500U	1U
Trichloroethene, ug/l	2800	0.4J	3	79000	0.3J
cis-1,2-Dichloroethene, ug/l	1000	1U	10	2900	1U
trans-1,2-Dichloroethene, ug/l	17J	1U	0.5J	500U	1U
Vinyl chloride, ug/l	130	1U	6	780	1U
Dilution Factor	20	1	1	500	1
Analysis Date	10.15.00	10.15.00	10.15.00	10.16.00	10.15.00
Batch ID	1B1015	1B1015	1B1015	2B1016	1B1015

SEVERN TRENT SERVICES
STL Savannah
5102 LaRoche Avenue • Savannah, GA 31404 • Tel: 912 354 7858 • Fax: 912 352 0165 • www.stl-inc.com

LOG NO: S0-06908
Received: 06 OCT 00
Reported: 26 OCT 00

Mr. Andrew Harper
Environeering, Inc.
16350 Park Ten Place Ste 140
Houston, TX 77084

Project: ALCAS/137-08
Sampled By: Client
Code: 180701025

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
06908-17	Method Blank		ALCA10
06908-18	Lab Control Standard % Recovery		ALCA10
06908-19	LCS Accuracy Control Limit (%R)		ALCA10
06908-20	Method Blank		ALCA10
06908-21	Lab Control Standard % Recovery		ALCA10

PARAMETER	06908-17	06908-18	06908-19	06908-20	06908-21
Volatiles (CLP-10/92)					
Tetrachloroethene, ug/l	1U	140 %	60-140 %	1U	100 %
Trichloroethene, ug/l	1U	100 %	60-140 %	1U	100 %
cis-1,2-Dichloroethene, ug/l	1U	---	---	1U	---
trans-1,2-Dichloroethene, ug/l	1U	---	---	1U	---
Vinyl chloride, ug/l	1U	140 %	60-140 %	1U	140 %
Dilution Factor	1	1	---	1	1
Analysis Date	10.15.00	10.15.00	---	10.16.00	10.16.00
Batch ID	1B1015	1B1015	1B1015	2B1016	2B1016

NEW YORK LAB ID#10842

Steven J. White
Steven J. White, Project Manager

Final Page Of Report

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Savannah Laboratories
a division of Severn Trent Laboratories, Inc

- 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
- 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (850) 878-3994 — Fax: (850) 878-9504
- 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- 6712 Benjamin Rd., Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.: 137-08	PROJECT LOCATION (STATE): NY	
STL (LAB) PROJECT MANAGER: White	P.O. NUMBER	CONTRACT NO.	
CLIENT (SITE) PM: Alcas	CLIENT PHONE: 281 578 5800	CLIENT FAX: 2815785875	
CLIENT NAME: ENI (ENVIRONEERING)	CLIENT EMAIL: Twhite@environeeringinc.com		
CLIENT ADDRESS: 16350 Park Ten Place Ste 140 Houston TX 77084			
COMPANY CONTRACTING THIS WORK (if applicable):			

PAGE 1 OF 2

STANDARD REPORT DELIVERY ○

DATE DUE

EXPEDITED REPORT DELIVERY (SURCHARGE) ○

DATE DUE

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: VOC	HCl	NUMBER OF CONTAINERS SUBMITTED	REMARKS
10/4/00	1230	RU1-GW-2780	G	X						3	
10/5/00	1400	RU2-GW-2790									
10/4/00	1100	RU3-GW-2780	G	X						3	
10/4/00	1830	RU4-GW-2780	G	X						3	
10/3/00	1730	RU5-GW-2770	G	X						3	
10/4/00	1715	RU6-GW-2780	G	X						3	
10/4/00	1445	RU7-GW-2780	G	X						3	
10/3/00	1645	RU8-GW-2770	G	X						3	
10/3/00	1440	RU9-GW-2770	G	X						3	
10/3/00	1500	RU10-GW-2770	G	X						3	
10/3/00	1530	RU11-GW-~~1530~~ 2770	G	X						3	
10/3/00	1415	RU12-GW-~~1415~~ 2770	G	X						3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Swafford	9/19/00		Byrd	10/5/00	1400			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Byrd	9/25/00	1600						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
	10/6/00	8:55	YES / NO		SD-06908	

ORIGINAL

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah Laboratories
A division of Severn Trent Laboratories, Inc

●	5102 LaRoche Avenue, Savannah, GA 31404	Phone: (912) 354-7858	Fax: (912) 352-0165
○	2846 Industrial Plaza Drive, Tallahassee, FL 32301	Phone: (850) 878-3994	Fax: (850) 878-9504
○	900 Lakeside Drive, Mobile, AL 36693	Phone: (334) 666-6633	Fax: (334) 666-6696
○	6712 Benjamin Rd., Suite 100, Tampa, FL 33634	Phone: (813) 885-7427	Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.: 137-08	PROJECT LOCATION (STATE): NY
STL (LAB) PROJECT MANAGER: White	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE) PM: Alcas	CLIENT PHONE: 281 578 5800	CLIENT FAX: 2815785800
CLIENT NAME: ENI (ENVIRONEERING)	CLIENT EMAIL: twhite@environeeringinc.com	
CLIENT ADDRESS: 16350 Park Ten Place Ste 140; Houston TX, 77084		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE 2 OF 2

STANDARD REPORT DELIVERY ○
DATE DUE
EXPEDITED REPORT DELIVERY (SURCHARGE) ○
DATE DUE

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX: COMPOSITE (C) OR GRAB (G) INDICATE	MATRIX: AQUEOUS (WATER)	MATRIX: SOLID OR SEMISOLID	MATRIX: AIR	MATRIX: NONAQUEOUS LIQUID (OIL, SOLVENT, ETC)	REQUIRED ANALYSES: VOC	REQUIRED ANALYSES: HCL	NUMBER OF CONTAINERS SUBMITTED	REMARKS
10/4/00	1830	RU4-GW-27800	G	X				X		3	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
Swafford	9/19/00		Byrd	10/5/00	1400			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
Byrd	9/25/00	1600						

LABORATORY USE ONLY

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT	CUSTODY SEAL NO.	STL-SL LOG NO.	LABORATORY REMARKS:
	10/6/00	8:55	(YES) NO		50-06908	

ORIGINAL

ENVIRONEERING, INC.

DATA VALIDATION REPORT
FOR
PHASE III PRE-DESIGN INVESTIGATION
FOR A
REMEDY DECISION UPDATE

ALCAS CUTLERY CORPORATION PROPERTY

OLEAN WELLFIELD SUPERFUND SITE

OLEAN, NEW YORK

D.1 DATA VALIDATION SUMMARY

Groundwater (liquid matrix) samples were collected from the Site on October 3, 2000 through October 5, 2000. Analytical results from these samples were reviewed by ENVIRONEERING for usability with respect to the Work Plan and USEPA SW-846 analytical methods and the USEPA Contract Laboratory Program ("*CLP*"). The analytical laboratory used for this project was Severn Trent Laboratories ("*STL*") Savannah Laboratories.

D.1.1 Sampling and Chain of Custody

Samples were collected, properly preserved, shipped under a chain-of-custody (COC) record and received at STL within one to two days of sampling. All samples were received intact and in good condition at STL Laboratories.

D.1.2 Laboratory Analytical Methods

The groundwater samples were collected from the Site and analyzed for the following site-specific chlorinated organic constituents:

- Tetrachloroethene;
- Trichloloethene;
- cis and trans 1,2-Dichloroethene; and
- Vinyl Chloride.

The volatile constituents were analyzed using Volatiles (CLP-OLC02.1) Fraction. The laboratory data were reviewed and qualified with the following validation flags:

"U" not detected at the designated value;
"J" estimated at the designated value;
"UJ" not detected and estimated at he value designated;
"D" diluted sample at designated value; and
"R" unusable value.

D.1.3 Laboratory Data Packages

The data packages received from STL Savannah Laboratories were paginated, complete and overall were of good quality. Electronic copies of the data, in a "PDF" format, presented on compact discs ("CDs") were made by an independent contractor at the request of ENVIRONEERING.

D.1.4 Volatile Organic Analyses

Field duplicate samples collected from RU-4 showed a >60% difference for TCE, and a >67% difference in cis 1,2-dichloroethene. All other reported volatile organic results were considered acceptable and did not warrant qualification resulting from data validation.

D.2 DATA VALIDATION REPORT

D.2.1 ALCAS Pre-Design Investigation

The data review has been completed for the data packages generated by STL Savannah Laboratories containing groundwater (liquid matrix) samples from the Site. All of the samples were properly preserved, shipped under a COC record, and received intact by the laboratory.

D.2.2 Volatile Organics

The following items were reviewed for compliancy in the volatile analysis:

1. Custody documentation;
2. Holding times;
3. Surrogate recoveries;
4. Matrix Spike ("*MS*") and Matrix Spike Duplicate ("*MSD*") precision;
5. Laboratory method blank and trip blank contamination;
6. Gas chromatograph/mass spectrometer ("*GC/MS*") performance;
7. Sample result verification and identification;
8. Internal standard responses;
9. Initial and continuing calibrations;
10. Quantitation limits;
11. Field duplicate precision; and
12. Data completeness.

These items were considered compliant and acceptable in accordance with standard data validation protocols.

D.2.3 Initial and Continuing Calibrations

All initial calibration compounds were compliant with a minimum relative response factor ("*RRF*") of 0.05 and a percent relative standard deviation ("*% RSD*") of 30 percent with the exception of RSD for Bromoform (36.2%) and 1,2-Dibromoethane (38.5%). These compounds were not on the Site-specific constituent list for this investigation, therefore the laboratory did not report the findings of these compounds in their report of results. All continuing calibration compounds were compliant with minimum RRF of 0.05 and a maximum percent difference (%D) of ± 25 %.

D.2.4 Usability

Sample duplication from RU-4 showed a >60% difference for TCE, and a >67% difference in cis 1,2-dichloroethene. The differences have been attributed to the fact that sufficient volumes of groundwater were not available to provide a true "split" of the sample collected. All efforts were made in the field to provide as true a duplicate as possible. A summary of the duplicate sample results are provided on Table D-2-1.

Therefore, sample results from RU-4 are questionable. All other reported volatile sample results were considered usable following data validation.

ENVIRONEERING, INC.

TABLE D-2-1
GROUNDWATER QA/QC SAMPLING SUMMARY
OCTOBER, 2000
OLEAN WELLFIELD
ALCAS SITE
ALCOA REMEDIATION

Well No.	Units	Tetrachloroethene	Trichloroethene	cis 1,2-Dichloroethene	trans 1,2-Dichloroethene	Vinyl Chloride
RU-4	ug/L	500U	130000 D	4,600	110 J	1,100
RU-4 Dup	ug/L	500U	79,000	2,900	500U	780
Trip Blank	ug/L	1.0U	0.3 J	1.0U	1.0U	1.00

"U" denotes not detected at the designated value.
"J" denotes an estimated value.
"D" denotes a diluted sample at the designated value.

D.2.5 Summary

The quality assurance objectives for data included examinations for precisions, completeness, representation and comparability. The volatile data reported by STL Savannah Laboratories were complete and usable.